



**2018** GLOBAL OBSERVATORY  
**ON NON-STATE  
CLIMATE ACTION**



**BOOK 2**

The mobilisation  
of the local and  
subnational governments



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# Local and subnational governments, on the forefront of the fight against climate change

**The success of the Summit in Lyon, «Climate and Territories», in July 2015, was the beginning of the creation of the association «Climate Chance», the only international association of the “climate galaxy» to gather, the main actors of the major non-state groups recognized by the UN: NGOs, communities, unions, companies, researchers..., to deliver a common message and develop action dynamics.**

From this first summit, we insisted on the final declaration, largely signed by the main non-state global structures, and especially all major local government networks, on the importance of the territorial approach.

In Lyon, we also insisted on the importance of the commitments made by these networks of communities, all represented by mayors and presidents of regions, and we ourselves advanced, based on a rather cursory aggregation, the impressive potential saving the equivalent of two gigaton of CO<sub>2</sub> per year by 2020, if all these commitments are met. These local and subnational governments accounted for 13% of the planet's population, and we quickly calculated that that streamlining the commitments would save around 15 gigatonnes per year compared to a «business as usual» scenario, a drop guaranteeing a stabilization of the climate in line with the 2°C trajectory, as proposed by IPCC, an inter-governmental group of climate experts.

Three years later, other major summits of mayors and subnational chairpersons, in Paris

during COP 21, in Agadir during the first Climate Chance Summit, in Edmonton in relation with IPCC work, in San Francisco last September ... have reinforced these commitments, made progress and established an outlook.

**We are convinced, through the approach of the «Climate Chance Observatory» for non-state action, that the time has come for a first analysis of the action taken.**

While doubts are growing about the ability of the international community to stabilize the climate below 2°C, and even more below 1.5°C, if we will convince other actors to engage, we must demonstrate that initiatives taken are working and being multiplied, and their quantitative impact will enable us to build a trajectory compatible with the stabilization of the climate.

Observatory means an uncompromising approach to the actions taken, a method of analysis based on the reliability of the data provided, not only to aggregate commitments. The exercise was not simple, first of all because



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quite a few local and subnational governments provide consolidated data on the evolution of their CO<sub>2</sub> emissions. Only some hundreds of them, mostly in Europe and North America, can be followed over time. It is too little to draw precise quantitative lessons, let alone to venture into a global aggregation that would participate in «bridging the gap», between the insufficient commitments of the States and the efforts highly recommended by the scientific community.

However, it does not mean that the mobilization of local and subnational governments is not at the heart of the response to the challenge of climate change. Through their decisions, elected representatives and territorial actors have a very strong influence on inhabitants' daily lives, their mobility, their habitat, their food ... and therefore their GHG emissions.

**To best reflect this mobilization, exceptional in many territories, we have made the choice to move away from a quantitative approach only in terms of CO<sub>2</sub> saved. The three chapters of this Book 2 – 2018 give a trustworthy and pedagogical inventory of the situation and actions taken.**

**First of all, this 2nd Book focuses on the progress of major global dynamics; the Global Convention of Mayors and the Under2 MOU of regions and states, then on the main local and subnational networks whose action is irreplaceable. Allowing yourself to be oriented in the entanglement of initiatives seemed to be a condition for any impact analysis. Their reinforcement**

**in the last two years is a fact that deserves to be emphasized**

We then return, through the analysis of 24 territories, to «success stories» which demonstrate that it is possible to massively reduce CO<sub>2</sub> emissions in a short time, when the political will and the tools of interventions are implemented. However, we do not seek to deny the difficulties of implementation or disappointing results, or the progress made by developing territories whose emissions are not an indicator. Finally, our «Around the World in 80 initiatives», without it being a palmares, shows the extreme creativity and diversity of the actions taken.

The mobilization of representatives and territorial actors is not yet sufficient to stabilize emissions, but this report, one of the most comprehensive to date, shows the reality and the strength of the current dynamic that is not limited to the commitments of tribune, but carries one of the most tangible and increasingly measurable hopes of a global response from the territories, to the climatic challenge.



## CLIMATE CHANCE ASSOCIATION

Since 2015, the Climate Chance Association is participating in the mobilization against climate change. It is the only international organisation that aims to bring together all the non-state actors recognized by the UN (the 9 groups of actors: local authorities, companies, NGOs, trade unions, scientific community, agricultural, youth, indigenous peoples and women organisations), to develop common priorities and proposals and to strengthen stakeholders dynamics through networking (thematic coalitions, summits, action portal).

The Climate Chance Association supports the central role of territories in climate action and the inseparable link between the climate agenda and the Sustainable Development Goals. The messages carried by the Climate Chance Association in its advocacy documents and the main themes addressed in the summits, are collectively discussed with the constant concern for the search for consensus, in an orientation council where the most representative structures of non-state actors are invited, in particular the focal points of the 9 major groups recognized by the United Nations Framework Convention on Climate Change (UNFCCC).

• **The Climate Chance Association supports the central role of territories in climate action and the inseparable link between the climate agenda and the Sustainable Development Goals** •

### • THE CLIMATE CHANCE ASSOCIATION AND ITS OBSERVATORY ARE SUPPORTED BY: •



# THE CLIMATE CHANCE OBSERVATORY

● In order to strengthen the action of non-state actors and give credibility to climate stabilisation scenarios, the Climate Chance Association launched in 2018 a Global Observatory of Non-State Climate Action, which aims to explain the evolution of greenhouse gas emissions, by crossing national public policies, sectoral dynamics, the implementation of the commitments and the non-state actors' best practices at the local level. First-of-its-kind, published in French and English, this report will provide decision-makers, journalists, researchers, students and newcomers with a detailed framework for understanding major program areas and a first level of information and action analysis, particularly at the local level, in order to achieve the Paris Agreement and the Sustainable Development Goals.

● **IN BOOK 2** ● on « The Mobilisation of local and subnational governments», **SECTION 1** we have synthesised the elements of evaluation and assessment of the main local and subnational networks engaged in fighting climate change. This synthesis, based on their annual communications, their online portal, and our mutual exchanges, allows us to understand the recent trends of the implemented projects and the state of reporting on climate action of local authorities across the world. **SECTION 2** illustrates this first synthesis using 23 study cases of cities and regions which have succeeded in implementing public policies. This series of case studies has been chosen based on the recent activity of local and subnational governments, including the publication of local climate action plans, generally related to the initiatives described in the first section. For each of these cases, thematic

● **This synthesis allows us to understand the recent trends of the implemented projects and the state of reporting on climate action of local authorities across the world** ●

axes are put forward. Finally, **SECTION 3** offers a global overview of local public policies recently implemented through 80 short illustrations from a constant news watch, and for many, from the contributions of the project holders themselves made within [The Cartography of Action](#).



# The mobilisation of the local and subnational governments





**The Climate Chance Observatory has used this territorial mobilisation report to offer an insight into the progress of initiatives led by communities and their networks. This report provides some facts and figures surrounding the increasing involvement of local communities in the formulation and implementation of climate strategies, and their organisation worldwide. It seeks to offer a general overview with a view to complementing and building on the individual contributions from each of these networks. It includes around twenty case studies analysing trends in emissions and the organisation of public climate policies at the local level throughout the world (Section 2), and an analysis of recent trends in 10 sectors of regional public policy included in our “round-the-world trip in 80 initiatives” (Section 3).**

In Chapter 2, the Climate Chance Observatory will outline the landscape of the main networks involved in actions to reduce their members’ greenhouse-gas emissions, to help readers navigate this “constellation of community networks”. This report outlines the background and composition of each of them, this report is one of the few existing summaries to present the main organisations and community initiatives in this area, by outlining their goals and ambitions and the links that bind them. We have based our report on their reporting platforms and reports published in 2017 and 2018, including material presented at the Climate Action Summit in California in September 2018. This outline includes trends in the number of members and signatories, deliverables such as completed actions and published inventories and progress achieved. We have also provided an up-to-date summary of the projects and programmes of the different networks in 2017-2018.

This overview of community involvement reveals first and foremost a similar vitality in towns and regions. The number reporting their emissions to the CDP and carbonn® Climate Registry (cCR) doubled between 2015 and 2018, with huge numbers of positive results, some of which could be classed as spectacular. This rapid progress is, nonetheless, especially concentrated in Europe where many communities have enlisted in the European Covenant of Mayors since 2008,

and, to a lesser extent, in North America, a region firmly committed to the Compact of Mayors launched in 2014. There has been less reporting and measurable progress in Asia, the Middle East, Latin America and sub-Saharan Africa. In the latter, involvement has grown since the Covenant of Mayors in Sub-Saharan Africa was introduced, with 134 members and more than thirty cities interested in joining the initiative in the near future. Apart from some activity on the part of Japanese cities through the cCR, the poor representation of Asian cities, particularly Chinese regions, is particularly significant and this has led to a global imbalance, given that a large proportion of territorial emissions have consequently not been covered. It should further be noted, interestingly, that if we use the C40 cities reporting (only considering direct emissions and from electricity production – scope 1 and 2), that cities in emerging countries often emit as much as industrialised countries, and that a major challenge lies in providing these cities with support to find urban solutions that emit less CO<sub>2</sub> and access to financing.

In a report published on the occasion of the Global Climate Action Summit (GCAS) “*Global climate action from cities, regions, and businesses*”, the New Climate Institute, the Netherlands Environmental Assessment Agency (PBL) and Data-Driven Yale, found that, in 2018, 8 237 cities in

128 pays, with 16% of the world's population, and 182 regions in 37 countries with 15% of the world's population, were involved in at least one of the main community networks – partly described in this section – and provided climate data. This compilation shows that, in total, local governments have made almost 6,000 commitments. These commitments, broadly concentrated in Europe with 5,679 recorded commitments, from cities and regions with a total of 214 million inhabitants, frequently overlap. However, there are only 81 commitments recorded for communities in East Asia and the Pacific region, and yet these relate to a very sizeable population (98 million inhabitants). Furthermore, the report published on the occasion of the Global Climate Action Summit in California seeks to assess the potential for reducing CO<sub>2</sub>eq (or greenhouse gas) emissions of the initiatives taken by major international local community networks between now and 2030. Indeed, the initiatives taken by the C40 could lead to a reduction of 0.8 GtCO<sub>2</sub>eq/year by 2030, those of the Global Covenant of Mayors to a reduction of 1.3 GtCO<sub>2</sub>eq/year by 2030, and of 5 GtCO<sub>2</sub>eq/year for the communities involved in the Under2 MoU network.

## • This first year allows us to lay the foundations for monitoring, on a long-term basis, local-government initiatives and global covenants •

The Climate Chance Observatory is interested in assessing the consistency of the actions implemented with this particular potential. At this point, it is totally impossible to aggregate results as reporting scopes, periodicity and methods are far too dissimilar. Nonetheless, a number of

results can be identified, from studies conducted by the Joint Research Centre (JRC) for the Covenant of Mayors or C40 cities: the cities and regions where results have been the most spectacular are mainly territories which seek to align all public action, within the framework of their climate plans, as can be seen in several of our case studies. The cities involved are often those with heating networks or those which find it relatively easy to include renewable energy and new technologies and, in most cases, have a strong public grip on these networks. On the contrary, in the case of transport, results are frequently less clear cut. In the case of regions, where the emissions involved are more wide ranging, the determination and performance of major regions is very welcome. These are generally regions with extensive powers as part of federal states (United States, Canada, Germany, etc.). There is also the warning issued by the last annual *carbonn*<sup>®</sup> Climate Registry report which shows the difficulties involved in effectively implementing a considerable number of these commitments to act, particularly due to a lack of technical and financial resources.

This first year will allow us to lay the foundations for monitoring, on a long-term basis, local-government initiatives and global covenants and our quantitative and qualitative analyses will be refined in future reports, as we keep a watch on new emerging data.

# GLOSSARY OF LOCAL GOVERNMENT NETWORKS

## **CLIMATE ALLIANCE OF EUROPEAN CITIES WITH INDIGENOUS RAINFOREST PEOPLES**

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international association founded in 1990 with a secretariat in Brussels. The association brings together different levels of governance (local, national, European, international) on projects related to the reduction of greenhouse gas (GHG) emissions, biodiversity, the preservation of tropical forests and awareness of the public on these issues. More than 1,700 cities and local governments are members around the world.

## **C40 (CLIMATE LEADERSHIP GROUP)**

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The C40 is a global network of major cities created in 2005, at the initiative of the Mayor of London along with 18 megacities to implement climate actions and to reduce GHGs. Today it brings together 96 of the world's largest cities, representing more than 650 million people and a quarter of the world's economy. Created and run by the cities, the C40 facilitate dialogue amongst city officials and focuses on the fight against climate change, the implementation of urban programs to promote low-carbon and resilient development of cities, and the economic and social co-benefits.

## **CARBON NEUTRAL CITIES ALLIANCE**

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Created in Copenhagen in 2014 between major cities pledging to reduce their emissions by 80% or more by 2050. It is administered by the North American municipal network Urban Sustainability Directors Network (USDN) in partnership with the C40 and the Innovation Network for Communities (INC). The alliance is made up of 20 cities, most of which are also members of the C40 network.

## **UNITED CITIES AND LOCAL GOVERNMENTS (UCLG)**

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Founded in 2004, it is the world's leading organization of twin cities and towns. It ensures the representation of local authorities to international institutions to defend their values and their role in the major issues of global governance such as climate change. As such, UCLG was heavily involved in drafting the Mexico Pact. The members of this association (cities or local government associations) are present in 140 UN Member States and represent nearly half of the world's population.

## **CITIES CLIMATE FINANCE LEADERSHIP ALLIANCE (CCFLA)**

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Alliance launched in 2014 at the UN Secretary-General's Climate Summit, composed of more than 40 public and private organizations and investors committed to accelerate and catalyse financing in low-carbon and resilient infrastructure in urban areas. Since 2016, the R20 hosts the Alliance Secretariat, with the FMDV, UNEP and UNDP.

## **THE COUNCIL OF EUROPEAN MUNICIPALITIES AND REGIONS (CEMR)**

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CEMR was founded in Geneva in 1951 by a group of European mayors, before opening its ranks to the regions. It gathers today more than 60 national associations of cities and regions from 41 countries, representing approximately 130,000 cities and regions. CEMR works to promote a united Europe based on local and regional self-government and democracy, by supporting the Council of Europe's European Charter of Local Self-Government, by strengthening the contribution of local and regional authorities, by influencing the legislation and policies of the European Union, by promoting the exchange of information at local and regional level, and by cooperating with its partners elsewhere in the world. CEMR promotes twinings, which is a network of tens of thousands of local partnerships in Europe, and coordinate PLATFORMA, the coalition of local and regional actors for development and decentralized cooperation at the global level. CEMR is also the European section of the world association United Cities and Local Governments (UCLG).

## **ENERGYCITIES**

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European Association of Cities in Energy Transition, created in 1990. It represents 1,000 cities in 30 countries. The association seeks to strengthen the skills of communities in the field of sustainable energy, represent their interests in the European Union, and act as a platform for exchange of experiences for the implementation of projects. In addition, this network is one of the founding partners of the Covenant of Mayors for Climate and Energy launched in 2008.

## **EUROCITIES**

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Network founded in 1986 by the mayors of 6 major European cities, now gathering more than 140 cities in 34 countries. The association is open to cities of 250,000 or more inhabitants. Its action is based on three pillars: building networks between cities around different themes, representing the interests of cities in the European institutions and promoting the action of cities at international events. The climate and the integration of the environment are among its priorities. In addition, this network is also one of the founding partners of the Covenant of Mayors for Climate and Energy, launched in 2008.

## **FEDARENE (EUROPEAN FEDERATION OF AGENCIES AND REGIONS FOR ENERGY AND THE ENVIRONMENT)**

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Federation created on June 8, 1990 by 6 regional authorities: Rhône-Alpes, Provence-Alpes-Cote-d'Azur, Wallonia, País Vasco, Aquitaine and Nord-Pas-de-Calais. Encouraged by various programs of the European Commission, these authorities wanted to make the regions' voices heard in the debate on energy and environmental policies at European level. It seeks to promote the exchange of experiences and the development of transnational projects by providing a forum for discussion, for its members and all stakeholders involved in the energy transition: public authorities, non-governmental organizations, citizens, small and medium-sized businesses and financial institutions. Successive enlargements of the European Union have extended the sphere of influence of FEDARENE. Today, more than 70 organizations from 20 European countries form the FEDARENE cooperation network. In addition, this network is also one of the founding partners of the Covenant of Mayors for Climate and Energy, launched in 2008.

## **GLOBAL FUND FOR CITIES DEVELOPMENT (FMDV):**

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International alliance of local and regional governments that enables emerging and developing local governments to access climate finance. The FMDV supports sustainable development and climate projects by providing its technical expertise and financial engineering and acting as a hub of knowledge and recognized facilitator. FMDV has mobilized or collaborated with more than 1,300 cities and regions from more than 110 countries, 250 private companies and most of the technical and financial partners in local development.

## **ICLEI – LOCAL GOVERNMENTS FOR SUSTAINABILITY**

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Organization founded in 1990 and it now includes more than 1,500 communities of all levels of population and governance (cities, towns and regions) in 124 countries. It is currently the main organization of local governments dedicated to sustainable development in the world. It is a founding member of the Global Covenant of Mayors for Climate & Energy.

## **NRG4SD (NETWORK OF REGIONAL GOVERNMENTS FOR SUSTAINABLE DEVELOPMENT)**

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International network created in 2002 on the occasion of the Johannesburg Earth Summit, made up of regional governments and regional and local government associations committed to promoting sustainable development, biodiversity and the fight against climate change. Today it gathers 50 federated states and regional governments from 30 countries and 7 associations of states and regions. The network is accredited to UNEP, to the UNFCCC and to the Convention on Biological Diversity, and it organized the Saint-Malo Summit of Regions on climate change issues. It is the secretariat of the RegionAdapt initiative.

## **R20 (REGIONS OF CLIMATE ACTION):**

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Organization created in 2010 by Arnold Schwarzenegger then governor of the State of California, and other world leaders, in cooperation with the UN. The R20 is a public-private partnership, gathering local governments, private companies, financial institutions, academic institutions, government organizations, intergovernmental organizations and UN agencies to develop and implement carbon-neutral, sustainable regional projects, measurable and scaled up on a large scale. It has more than 50 members regions and more than 130 partners.

## MAIN PARTNERS OF THESE NETWORKS

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### THE CLIMATE GROUP:

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Non-governmental organization created in 2004 whose activities focus on the animation of networks of large companies and local governments around the energy transition, the diffusion of new low-carbon technologies and renewable energies. It is the secretariat of the Under2 Coalition. In addition, since 2009 the Climate Group organizes the Climate Week in New York City, in parallel with the United Nations General Assembly.

### CDP

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International non-profit organization, founded in 2004, which provides a global reporting platform for businesses, cities and regions to measure, disclose, manage and share environmental information, and facilitate decision-making by policy-makers and the network of CDP investors representing more than 1,000 billion assets. More than 500 cities report their emissions and climate actions on the CDP-Cities platform. Cities and regions data are available on their open data portal.

## THEMATIC

- WASTE 
- AWARENESS 
- DECENTRALIZED COOPERATION 
- URBAN PLANNING 
- ENERGY 
- LAND USES 
- BUILDING 
- FOREST 
- TRANSITION OF THE ECONOMY 
- TRANSPORT 
- FOOD 
- ADAPTATION 

## SECTION I



# Progress of global initiatives



**A SYNTHESIS OF THE EVALUATION AND TOPICAL ELEMENTS OF THE MAIN NETWORKS AND LOCAL GOVERNMENT INITIATIVES FOCUSED ON CLIMATE CHANGE, TO UNDERSTAND RECENT TRENDS IN PROJECTS IMPLEMENTED AND THE STATE OF REPORTING OF CLIMATE ACTIONS OF LOCAL AUTHORITIES THROUGH THE WORLD. IT ALSO PROPOSES A CLARIFICATION OF CARBON ACCOUNTING METHODOLOGIES AND EXISTING REPORTING PLATFORMS.**

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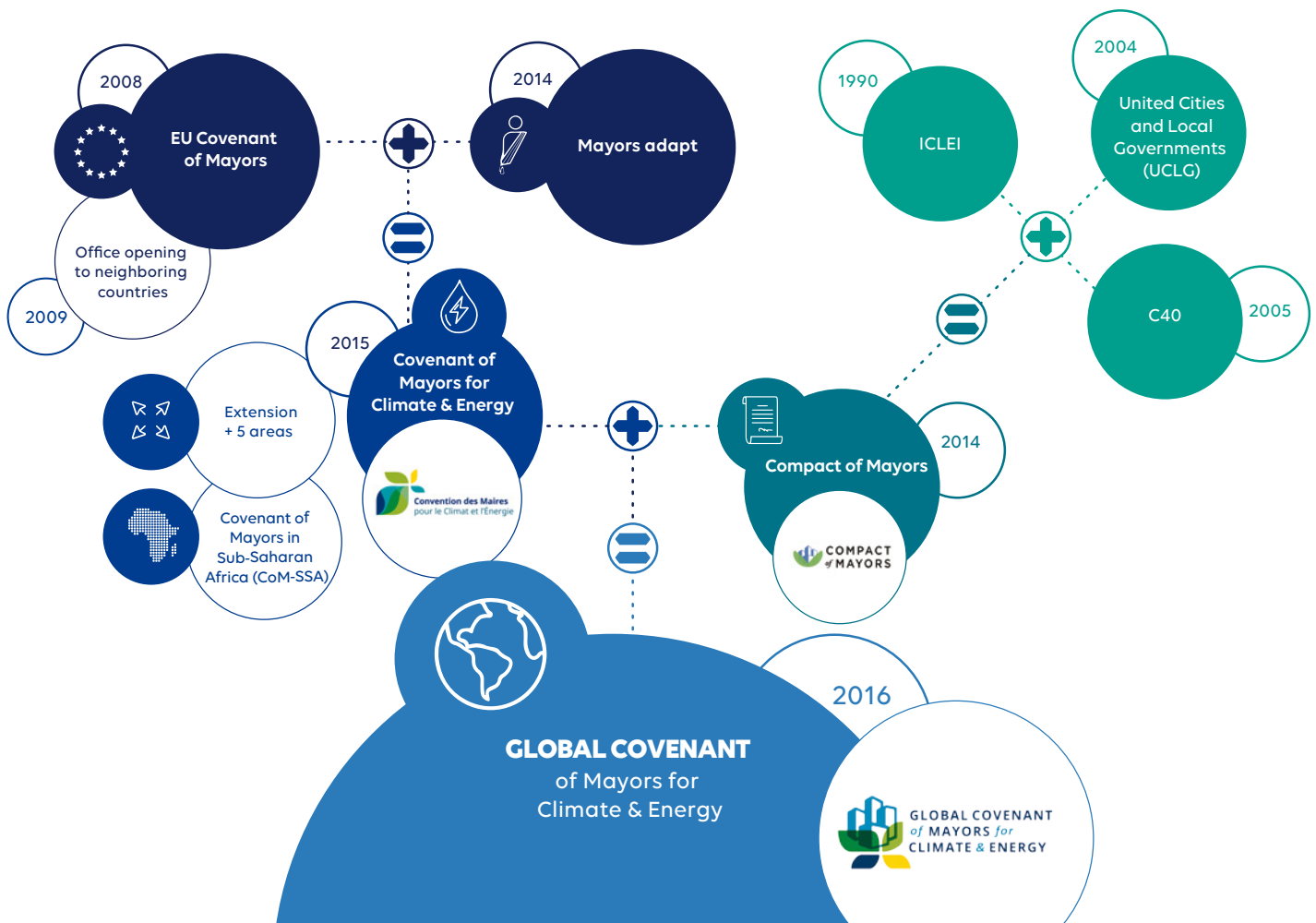
3 main approaches for calculating the emissions of a territory

Existing methods for carbon accounting

# The global covenants

## A. THE GLOBAL COVENANT OF MAYORS FOR CLIMATE & ENERGY

The Global Covenant of Mayors for Climate & Energy is an international alliance of cities and local governments arising from the merger in January 2017 between the “Covenant of Mayors for Climate & Energy” launched in 2008 by the European Commission, in cooperation with the main European local government networks (CMER, Energy Cities, FEDARENE, EUROCITIES, Climate Alliance, ICLEI Europe), and the “Compact of Mayors” launched worldwide in 2014 by ICLEI, CGLU and the C40. The aim of this merger was to increase the understanding and consistency of city and regional mobilisation and to facilitate the aggregation and monitoring of local climate data. It also aimed to address several issues relating to the awareness of the regional and national frameworks in which local governments operate, a shared reporting methodology adopted by all, and the nature and level of commitment of the member cities of these two networks, each with its own important history and past achievements.





# The European initiative of the Covenant of Mayors for Climate & Energy

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• **BACKGROUND AND GOALS** • The European Covenant of Mayors is an initiative launched and financed by the European Union after it adopted, in 2008, a 2020 climate & energy package, on the initiative of European local authority networks. It is managed by a consortium of European local authority organisations comprising the Council of Communities and Regions of Europe (CCRE), EUROCITIES, Climate Alliance, Energy Cities, the European Federation of Agencies and Regions for Energy (FEDARENE) and, since 2017, ICLEI Europe. In October 2015, the Covenant merged with Mayors Adapt, a further initiative launched by the European Commission to promote adaptation. It thus became the Covenant of Mayors for Climate and Energy, with three main pillars: mitigation, adaptation and access to sustainable energy. The latter component aims to alleviate energy poverty within communities.

Member European local authorities voluntarily commit to meet, and even exceed, the European Union's climate and energy targets by 2020: 20% reduction in greenhouse gases (GHG) compared with a chosen baseline year, through political commitment and the development and implementation of local action plans.<sup>1</sup> Since 2015, signatories have committed (or recommitted if they had already committed to following the 2020 goals) to the EU 2030 goals involving a reduction of 40% in their GHG emissions, and to develop a climate change adaptation plan at the local level. Signatories also commit to submitting, within two years of joining, a "Sustainable Energy Climate Action Plan" (SECAP) including an emission inventory, a climate action plan and a risk-and-vulnerability assessment of the effects of climate change and the key actions envisaged to implement their climate plan. **Finally, members must report their actions by submitting, every two years, a monitoring plan and, every four years, an inventory of climate and energy data.**

In 2009, the Covenant of Mayors extended membership to neighbouring countries outside the European Union as part of the CES-MED programme. This programme is financed by the European Neighbourhood Partnership Instrument (ENPI) to support local and national authorities in preparing their action plans in 10 countries on the Mediterranean rim (CoM-Med) as well as in Eastern Europe (CoM-East), and even in Central Asian countries<sup>2</sup>. In these regions, consortia of regional organisations form Covenant regional offices. Commitments differ depending on the particular office, and the Eastern European cities have committed to reduce their emissions by 30% by 2030 and not by 40% like the European Union cities.

The European online reporting platform entitled "MyCovenant" is made available to signatories of these regions and serves to coordinate all signatories, with, however, separate data management for each region. The European portal centralises the publication of local authority action and monitoring plans from the countries of the European Union, the European Free Trade Association, CoM-Med, CoM-East, and other neighbouring countries.

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<sup>1</sup> Other goals which are not compulsory but desirable in terms of European goals are the inclusion of 20% of renewable energy in the energy mix and a 20% improvement in energy efficiency.

<sup>2</sup> Mediterranean CES-MED: Algeria, Egypt, Israel, Jordan, Lebanon, Libya, Morocco, Palestine, Syria and Tunisia. Eastern Europe (East Covenant) and Central Asia: Armenia, Azerbaijan, Belarus, Georgia, Moldavian Republic, Ukraine, and Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan.

• **TRENDS IN COMMITMENTS AND DELIVERABLES 2015-2018** • In October 2018, the Covenant had approximately 8,013 active signatory local authorities (with action plans either submitted or in progress) in more than 50 countries in Europe and the surrounding area. More than 253 million inhabitants (mainly from European Union countries which account for almost 7,500 active signatories) are involved, namely the equivalent of almost 50% of the European Union population.<sup>4</sup> The Covenant is, however, unusual in that it includes a large number of small towns, with, in 2018, 66% of its signatories representing towns of less than 10,000 inhabitants in their region (Melica et al., 2018).

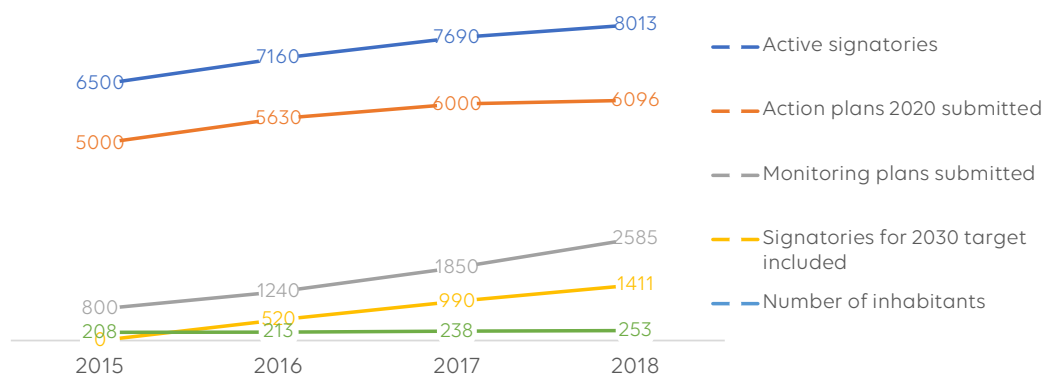


FIGURE 1. DEVELOPMENT OF THE EUROPEAN COVENANT OF MAYORS 2015-2018

(Sources : Compiled by the author from data supplied by the Covenant of Mayors)

A slowdown in the number of active signatories between 2017 and 2018 (see Figure 1) can be explained by a strategic choice made by the Covenant's Secretariat since 2016 which sought to encourage signatories already committed to 2020 goals to recommit to new 2030 goals. The mobilization of new signatories remains an important objective of the consortium. As a matter of fact, the number of cities which are new or former members and which have taken 2030 commitments, has sharply increased this year. Effectively, among the more than 8,000 active signatory local authorities, 1,411 have committed to fulfil or exceed EU objectives by 2030 (including new signatories and 2020 signatories).

In total, more than **6,100 2020 action plans have been submitted since 2008 and more than 30 2030 action plans since the beginning of 2018**. This figure is likely to increase very rapidly in the course of the second six months of 2018 and in 2019, which is the date by which the signatories which committed in 2016 must submit their action plans to meet this new deadline. Of the 5,516 2020 action plans recorded in October 2017 (representing 195 million inhabitants), one study shows that approximately 95% of these plans were from local authorities in the 28 countries of the European Union (Kona A. et al. 2018). 32% of the population of the EU is now covered by a Covenant action plan. 10 countries account for most signatories and, alone, for 5,490 action plans submitted (see Figure 2), representing 120 million inhabitants. Wide disparities exist between the sizes of local authority committed depending on country. In this sense, only 60 German local authorities have submitted SEAPs but these cover almost 17 million inhabitants, whereas the 3,184 action plans from Italian local authorities cover approximately 38 million inhabitants.

<sup>3</sup> In addition to the 7,750 signatories there are almost 1,500 signatories who have missed the deadline for submitting their action plans and are, for the time being, deemed to be "postponed". These signatories are, however, included in the number of cities committed to the Global Covenant of Mayors (see section below).

<sup>4</sup> 512.6 million on 1 January 2018 according to Eurostat

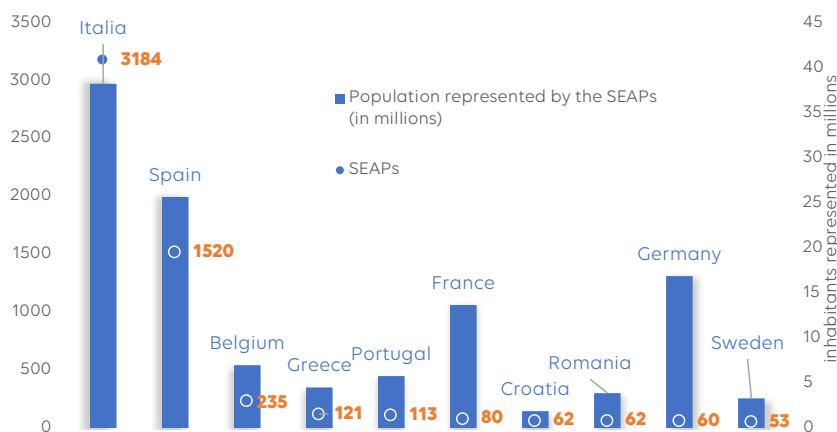


FIGURE 2. THE 10 COUNTRIES WITH THE GREATEST NUMBER OF SIGNATORIES WHICH HAVE SUBMITTED THEIR ACTION PLANS.

(Source : compilation taken from [Kona A. et al. 2018](#)).

• **PROGRESS SINCE 2015: TOWARDS ACHIEVING 2020 GOALS** • Each year, the Joint Research Centre (JRC) reports on the status of the reporting and progress achieved by the Covenant signatories towards the 2020 goals. The Monitoring Emissions Inventory (MIE) shows progress achieved on the basis of Baseline Emissions Inventories (BEI) which generally tend to take 2005 as their baseline year.

**On the basis of 315 monitoring inventories received in September 2016 (i.e. 18% of the 1,779 normally expected at that date, and observing annual emissions for the 2012-2014 period, the JRC has calculated a global reduction in emissions of 23% for all local authorities studied compared with the baseline inventories. This overall reduction in GHGs equates to the achievement of 58% of the goal of cutting emissions by 40% by 2030, recently set by the signatories to the Covenant. (JRC, 2016)**

To achieve this result, the signatories used three main levers (see Figure 3): making buildings more energy efficient and efficiently generating heat by increasing the share of renewables in its production (-36% emissions); increasing the generation of local renewable energy (-17% emissions); and improving energy efficiency in the transport industry (-7% emissions).

Average CO<sub>2</sub>-emission reduction of about 23% by 2016

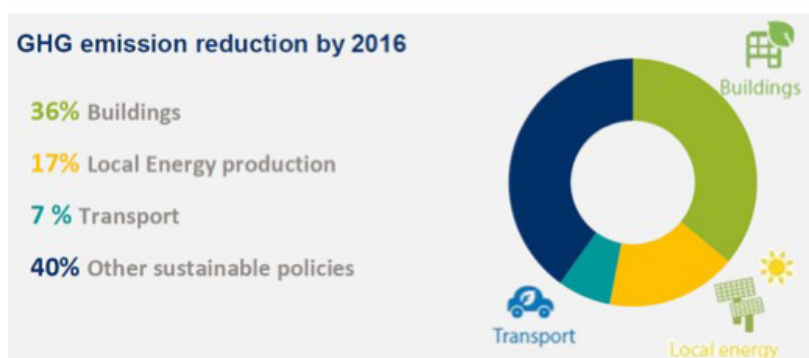


FIGURE 3. SOURCE OF REDUCTIONS IN GREENHOUSE GASES BY SECTOR

(Source : [EU Covenant key figures 2017](#))

According to the JRC, these significant reductions are due to an overall reduction of 18% in final energy consumption in the 315 local authorities analysed, i.e. a reduction of 89 TWh compared with the baseline year in each region. By 2030, the signatory local authorities voluntarily seek to achieve an overall reduction of 27% in energy consumption, and 67% of this goal was achieved in 2017. Furthermore, analyses of different energy-consumption sectors show a reduction of 5% in the consumption of electricity, a reduction of 27% in the final energy consumption of buildings and a reduction of 11% in the energy consumption of transport.

Another factor explaining this reduction in territorial emissions lies in an increase in the share of renewable energy in final energy consumption (see Figure 4). Depending on sector, we can see, in comparison with the baseline years, a sharp increase in the consumption of local renewable energy (34.4 TWh/year in 2017 compared with 6 TWh/year on average for the baseline inventory, i.e. an almost sixfold increase in production) and, at the same time, a reduction in the consumption of non-renewable energy in the heating and air-conditioning industries, and in the transport industry.

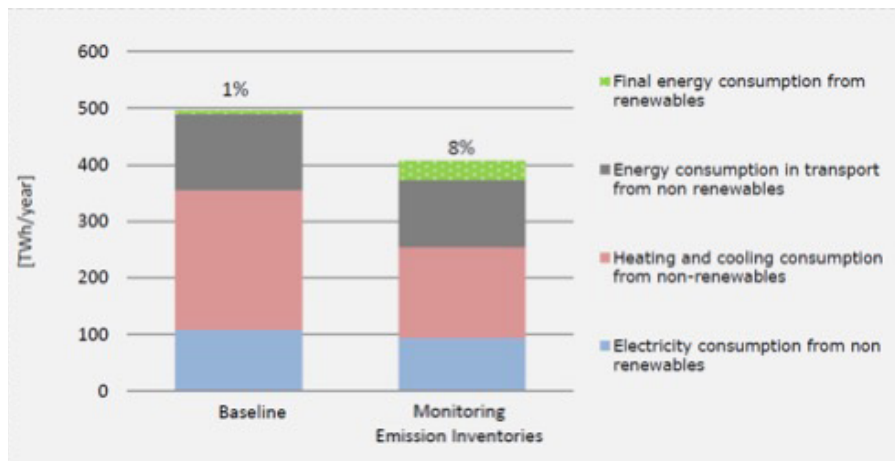


FIGURE 4. FINAL CONSUMPTION OF RENEWABLE AND NON-RENEWABLE ENERGY BY SECTOR, COMPARISON BETWEEN THE BASELINE INVENTORIES AND THE MONITORING INVENTORIES

(Source: [Covenant of Mayors in figures - 8 years assessment, 2017](#))

**These results show, by extrapolating results from 315 inventories, that in the case of the committed cities, European goals could be achieved or even exceeded by 2020.** In effect, this analysis of action plans shows that signatories have committed to reducing their emissions by 27% on average, 7 points more than the goals set by the European Union. **The results observed in 2016 show that these goals are well on the way to being achieved and should represent a reduction of 254 MtCO<sub>2</sub>eq/year by 2020, i.e. 31% of the reduction effort expected of the European states.**

Finally, in its October 2017 study, the JRC estimated, based on a model extrapolating the results and progress shown by the 533 inventories received by that date covering 21% of the covenant's population, that **the signatories of the Covenant could achieve a level of emissions of 0.15 tCO<sub>2</sub>eq/capita by 2050, a level consistent with a global rise in temperature of 1.5 degrees and the achievement of carbon neutrality** ([Kona A. et al. 2018](#)).

### Significant progress in the energy sector

Energy Cities in "[villes vertes en mouvement](#)" published in January 2018, estimates that the European Covenant of Mayors members have doubled the amount of decentralised heat generated locally from renewable sources compared with the baseline year chosen by its members (generally 2005 or 1990), they have increased the renewable energy used in transport by nine-fold and the green energy produced locally by eight-fold, and finally they have increased their final consumption of energy generated from renewable sources by five-fold.

TEXT BOX 1

## Extension and replicas of the Covenant since 2015

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### • THE INTERNATIONAL URBAN COOPERATION (IUC) PROGRAMME'S ENERGY AND CLIMATE PILLAR •

In 2015, the European Commission, through its Foreign Policy Instrument (FPI), financed the launch of five new offices (also managed by a consortium of organisations): North America, South America, Japan, India and China-Southeast Asia. The opening of these regional offices constitutes the European [International Urban Cooperation](#) programme's energy and climate pillar, which also includes two further pillars on urban development policies and regional cooperation. In May 2018, a South Asian office was officially opened as part of its programme in India, which will be responsible for the six countries in the sub-region: Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka.

Now, a total of nine offices (European Union Member States, Mediterranean, Eastern Europe, Covenant in Sub-Saharan Africa, North America, South America, Japan, India which has recently become the South-East Asia and China-East Asia office) are part of the European Covenant of Mayors, supported by different European Union policies: neighbourhood policy, cooperation and development policy, and, more recently, via foreign policy instruments. The Covenant has also extended its actions, through these regional offices, beyond mere mitigation to cover adaptation and energy access. All local authorities wishing to join the Global Covenant which are located outside the areas covered by these regional and national offices must now apply to the Global Covenant general secretariat, based in Brussels.

### • THE COVENANT OF MAYORS IN SUB-SAHARAN AFRICA (COM SSA) •

In 2015, the European Commission launched the "Covenant of Mayors in Sub-Saharan Africa" (CoM SSA), the African regional branch of the Covenant of Mayors, the secretariat and pilot activities of which it finances. Thirteen pilot cities benefit from direct financing for the development of their "Sustainable Energy and Climate Action Plan" (SECAP), covering the 3 pillars of adaptation, mitigation and energy access: Bangui, Bissau, Bouaké, Dakar, Kampala, Lubumbashi, Monrovia, Nouakchott, Pikine, Tsévié, Yaoundé III and IV, and the Zou joint local authority. The consortium members, coordinated by the Council of European Municipalities and Regions (CEMR), have four years to build the capacity of cities to introduce the Covenant of Mayors, by supporting local authority associations, helping cities to draw up action plans and coordinating with civil-society actors. In the 3rd quarter of 2018, it had **132 signatories from 34 different countries, representing more than 155 million inhabitants, more than 10% of the region's population.**

To help the signatories draw up their SEACAP, the JRC is currently producing a methodological guide specifically designed for African local authorities. During a consultation exercise organised by the JRC at the Climate Chance Summit – Africa in June 2018 in Abidjan, the representatives of African cities who attended had the opportunity to share their experience of preparing these plans and promote awareness of local African issues such as access and data compilation and management. Upon completion of this project, the JRC must verify and validate the plans and inventories of these 13 pilot cities.

## The Global Covenant of Mayors for Climate & Energy (GCOM)

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• **BACKGROUND AND GOALS OF THE COVENANT OF MAYORS** • The Compact of Mayors was launched in 2014 by Ban Ki-Moon, General Secretary of the United Nations, and Michael R. Bloomberg, UN special envoy on cities and climate change, and by mayors belonging to global cities networks, ICLEI, C40 and United Cities and Local Governments (UCLG). In 2016, the Covenant had approximately 600 members including the C40 network of the world's greatest cities. As is the case with the European covenant, signatory cities must submit an up-to-date GHG inventory, set themselves an emission-reduction goal, assess their vulnerability and, finally, regularly report their emissions/actions to the carbonn® Climate Registry, the initiative's official reporting platform, and also to the CDP.

• **MERGER WITH THE COVENANT OF MAYORS** • In 2016, the founding members decided to merge the two initiative (Compact of Mayors, and Covenant of Mayors), to form the Global Covenant of Mayors for Climate & Energy (GCOM). It is therefore the largest international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary climate action and move to a low emission, resilient society. Their aim at the time was to align membership processes, communications, reporting and monitoring for network members and the different regional offices created in 2015, and eventually afford greater transparency in the commitments and progress made by local authorities.

The [current proposal](#) for commitment, based on member commitments and opinions as of June 18, applies the respective requirements of both Covenants:

- To set an emissions-reduction target and submit a GHG inventory and a risk-and-vulnerability assessment within two years.
- Submit an adaptation/mitigation plan within three years of its signature. The submission of the sustainable energy access plan remains to be determined.
- A monitoring report every two years after the action plan.
- Follow all progress towards meeting these targets.

The framework should, however, be sufficiently flexible and modular in terms of regional offices to take account of the local and national realities of the local authority members. Targets should be set in line with each regional covenant or, for example, national goals. This leaves open the opportunity to report actions on the platforms currently used by the signatories of the two initiatives, such as MyCovenant, the carbonn® Climate Registry and the CDP-city (see below the part on reporting platform for further information). ICLEI and the CDP announced at the COP23 to work towards converging the two reporting platforms.

The merger of these two initiatives should also provide an opportunity to define the use of local government data. Their merger will support advocacy efforts for multi-actor and multi-level climate governance and seeks to facilitate the financing of regional projects, both by States and international bodies. The Global Covenant also seeks to bring together different strands of thought on strategies focusing on individual local realities, through climate data analysis.

## • UPDATE ON 2018 PROJECTS AND PROGRAMMES •

**Financing** • During the One Planet Summit of December 2017, the Global Covenant also announced several partnerships under the title [Global Urbis](#), with the European Commission, the European Investment Bank (EIB) and the European Bank for Reconstruction and Development (EBRD), to improve city access to financing and increase the flows they receive. The initiative seeks to promote the existence of a one-stop shop for local authorities, as pinpointed by EIB Vice-President, Jonathan Taylor, during the One Planet Summit ([EIB 2018](#)).

Several important developments come under this banner. The “**Invest4Cities**” Initiative was launched by the Global Covenant, the EIB and the EBRD, the European Commission and the special envoy on climate change Michael Bloomberg, during the high-level conference on sustainable finance held by the European Union in March 2018. They have called on investors worldwide to fulfil the commitments they made at the One Planet Summit in 2017, by raising USD 200 million to provide technical assistance for 400 southern cities and USD 600 million in credit facilities. This USD 800 million should be enough to mobilise USD 6 billion in total in public and private investment.

During the Global Climate Action Summit in San Francisco in September 2018, the EIB and GCOM officially launched a call for proposals, the [Global Climate City Challenge](#), for technical and financial assistance for the preparation and initiation of major low-carbon infrastructure projects, and the search for joint funding among signatories of the Global Covenant in Africa, Central Asia, Latin America and countries neighbouring the European Union. The first round will support six projects to be selected in early 2019. Furthermore, under the **Green Cities Framework**, the EBRD announced that it has provided USD 50 million in funding for infrastructure projects and plans a further USD 360 million for projects in 20 targeted cities ([EBRD 2018](#)).

**Research and Innovation** • Starting from the premise that the scientific climate agenda is still not sufficiently looking at local action, the Global Covenant launched [Innovate4cities in 2018](#), a collaborative framework involving different actors to identify the specific needs of cities in terms of research and innovation and thereby enrich the global scientific agenda through knowledge produced by local actors, academia and the private sector. This initiative also seeks to develop the scientific knowledge required for sustainable urban projects, by taking account of the specific features of each city: size of population, geographical assets, accessible technologies, etc. ([GCOM, 2018](#)). **More specifically, it calls on national governments to allocate a third of their research and development budget over the next 10 years to urban issues related to climate change, on the private sector to collaborate with cities and to disseminate more data crucially needed for decision-making and estimating co-benefits, and on academia to recruit 10 million students by 2025 to courses related to climate change.**



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## Local-authority access to funding is becoming a reality

A partnership between the Global Covenant and the World Bank City Resilience Program (CRP), announced at the One Planet Summit in December 2017, should ultimately allow the release of USD 4.5 billion to 150 cities worldwide, in the shape of credits to finance low-carbon, climate-resilient programmes or, as technical assistance, to facilitate the mobilisation of significant private capital. In July 2018, the programme included a portfolio of projects currently underway totalling USD 400 million in 55 cities in Africa, Asia, Latin America and the Mediterranean rim (see Figure 5), and it has allowed USD 12 million seed funding to be raised from third-party investors (EBRD 2018).

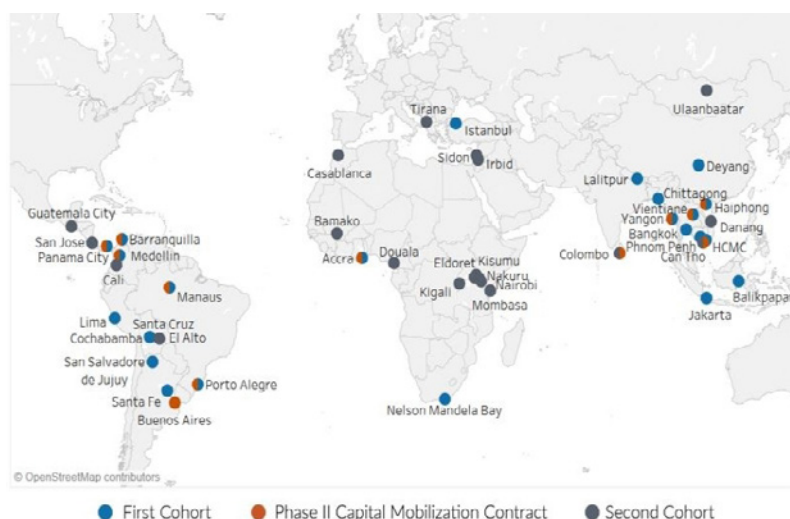


FIGURE 5.  
DISTRIBUTION OF  
CITIES FUNDED BY  
THE CRP

(Source: [BM 2018](#))

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### TEXT BOX 2

This programme follows the call issued by cities in the **Edmonton Declaration**, adopted as a preamble to the IPCC Cities and Climate Change Science Conference, held in Edmonton (Canada) from 5 to 7 March 2018. It calls for greater collaboration between local governments and the scientific community to develop a research and innovation plan to inform public policy and investment.

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## Promote a greater awareness of the territorial dimension in IPCC research and activities

The IPCC 5th assessment report of 2014 included, for the first time, one chapter on the adaptation of urban areas to climate change and another on the role of planning in the mitigation of climate change by cities. Notwithstanding, issues related to cities and climate still remain largely undocumented by the IPCC, and consequently the Edmonton conference, in preparing its 6th assessment report, sought to identify needs for documentation, stimulate global research and the production of knowledge on the diverse effects of climate change via contributions by local governments. The Innovate4Cities programme should further offer a substantial contribution to the production of an IPCC report specifically on cities. (Source: [Joint declaration of the participants at the Edmonton conference and Cities IPCC](#) website).

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### TEXT BOX 3



• **STATUS OF COMMITMENTS AND REPORTING 2018** • Although the number of members varies enormously from one region to the next, the Global Covenant is today the largest coalition of local governments in the world with more than **9,000 cities are committed to the initiative, comprising signatories from different regional covenants, in 129 countries, representing more than 780 million inhabitants.**

On its online platform, excluding the 8,259 cities<sup>5</sup> in Europe (including Russia), in September 2018, the Global Covenant listed **720 signatories, 98 inventories and 64 action plans.** The first action plans are expected from the new Global Covenant signatories from 2019 on, in the 3rd year after signing.

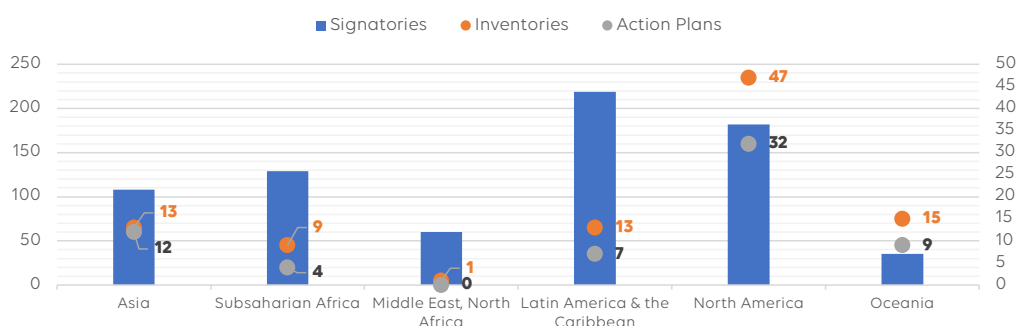


FIGURE 6. GEOGRAPHICAL DISTRIBUTION OF THE SIGNATORIES OF THE GLOBAL COVENANT OF MAYORS AND DELIVERABLES. (excluding data from the European Covenant of Mayors)

Although these figures reflect the geographical distribution of signatories and not necessarily their membership of a particular Covenant, they do, however, show the respective vitality of merged initiatives. Thus, leaving aside cities in Europe, 50% of all published inventories and plans are from North American cities (see Figure 6).

The [2018 Aggregation Report](#), the principles of which were presented at the Global Climate Action Summit, estimates that if current members achieve the targets that they have set themselves, they could achieve an effective reduction in annual emissions of 1.4 GtCO<sub>2</sub>eq in 2030 and 2.8 GtCO<sub>2</sub>eq in 2050.

The only rating data currently available estimates that **1,818 signatory cities have already reduced their emissions by 20% compared with their peak emissions, a reduction of 0.43 GtCO<sub>2</sub>eq, with the vast majority of these cities being members of the European based Covenant.** At the same time, the reporting of climate vulnerabilities and risks is improving and, this year, shows that the greatest dangers to the populations of the signatory cities to the Covenant are periods of extremely high temperatures (181 million inhabitants affected), floods and rises in water levels (193 million inhabitants affected).

<sup>5</sup> This figure reflects the geographical distribution of the signatories but does not correspond to the number of signatories of the European Covenant mentioned earlier, which brings together a number of sub-regional covenants (EU, Eastern Europe, Mediterranean, Central Asia), and makes a distinction between active members and postponed members (whose deadlines for deferring their plans have been exceeded).

## B. THE UNDER2 COALITION AND ASSESSMENT OF ACTIONS BY STATES AND REGIONS

### Background and composition of the Under2 Coalition

This coalition brings together the signatory regions<sup>6</sup> of the "Under2 MoU" Memorandum of Understanding adopted in 2015 prior to COP21, at the initiative of the states of California and Baden-Württemberg including 12 federal states and regions in its launch. Its text, which is not binding, commits them to maintaining rises in temperature to below 2 degrees by reducing emissions by 80 to 95% compared with 1990 by 2050 and/or achieving an annual emissions target of less than two metric tonnes per inhabitant by 2050. The Climate Group acts as the secretariat of the Under2 Coalition, and works in partnership with CDP for the Annual Disclosure.

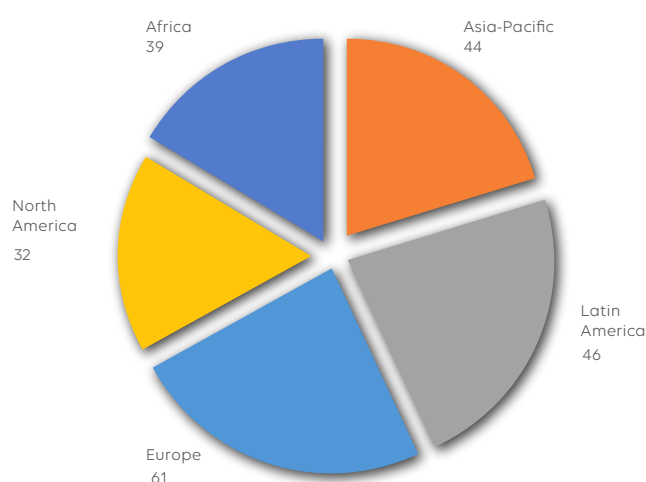


FIGURE 7. GEOGRAPHICAL DISTRIBUTION OF MEMBERS OF THE UNDER2 COALITION

Data provided by the Climate Group

The Under2 Coalition counts **222 signatories, over six continents and 44 countries. It has 21 national endorsers, and 3 states** endorsers which support the Under2 MoU implementation worldwide. These regions represent a total of 1.3 billion inhabitants.

### Update on projects and programmes in 2018

• **THEMATIC FORUMS** • The "[Under2 Coalition Highlights](#)" annual report presents the actions and progress of the coalition over the previous year (commitments, events, reporting, programmes) and, particularly, the platforms and thematic forums coordinated by the Secretariat to allow members to exchange good practices, resources and difficulties. The latest [peer-learning platform](#) to date, launched in 2018, is the "[Zero Emission Vehicle Project](#)" (ZEV), which should provide the regions with the resources they need to accelerate the deployment of this type of vehicles on the roads of those members who have committed to achieve fully zero-emission vehicles by 2050. Quebec is the first Canadian province to adopt a standard requiring manufacturers to offer more ZEV-certified vehicles, and the additional requirement of also certifying reconditioned models which are more affordable for those on low incomes.

<sup>6</sup> In this publication, the term region refers to any intermediate government between municipal governments and national governments.

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## **The Energy Transition Platform**

[The Energy Transition Platform](#) is one of the coalition's flagship projects. Between 2015 and 2018, this project connected 11 heavily industrialised regions and federal states with particularly high emissions, located in Europe, North America and Australia. The 11 regions in question accounted for a total of 13% of emissions in these three sub-continent and are home to 100 million inhabitants. During the first project phase, participants used webinars to discuss a variety of subjects, ranging from energy storage to smart grids, and this produced six regional case studies available on the [Under2 Policy Action Map](#). In 2017, the project entered its second phase facilitating closer collaboration between participants. Governments worked in small groups (innovation laboratories) on subjects relevant to their regions – community-based renewable energies, the energy efficiency of buildings and the decarbonation of the industrial sector. The governments also came together during two 3-day workshops, the first in Bilbao in June 2017 and the second in Essen in April 2018. Three policy briefs with recommendations and case studies on these subjects were compiled by the Grantham Institute and are [available](#) at the Under2 Coalition website.

TEXT BOX 4

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• **PROJECT FINANCING** • The Future Fund was created in 2016 with contributions from the local governments of Alberta, Ontario, Quebec, Scotland, South Australia, and Wales to finance initiatives and support the participation in the projects of emerging or developing regions or states. According to the Fund's first progress report, USD 160,000 was made available in 2017 (Future Fund Progress Report - 2017). For this first year, the Future Fund enabled, for example, the government of West Bengal (India) to update its climate action plan and raise its targets, the state of Yucatan (Mexico) to redevelop its MRV carbon-management system's online portal which holds data on the consumption of electricity and fossil fuels, peaks in demand, etc. It also allowed member regions to travel and meet up to exchange expertise, and this is how the government of Gujarat (India) travelled to South Australia to train its managers in energy production and storage, and the government of the Western Cape (South Africa) travelled to California to train in the implementation of a 2050 decarbonation roadmap. Finally, it enabled several beneficiary regions to participate in coalition activities during COP23.

In 2018, the Future Fund was funded by the states of Scotland, Wales and Quebec and launched a new project, in Colima, Mexico, which committed to update and publish its greenhouse-gas inventory. The Future Fund has also enabled new exchanges of expertise between the regions of São Paulo and Wales, on a 2050 decarbonation roadmap, between Cross River State and Quebec on sustainable forest management and reforestation, and between KwaZulu-Natal and Victoria. Finally, the Future Fund enabled 21 regions to attend the General Assembly of the Under2 Coalition which was held in San Francisco during GCAS 2018. This General Assembly brought together a record number of members with 73 regions in attendance.

“Important lessons have been drawn from the first year of the Future Fund – given the aforementioned resource constraints, administrative processes and authorization for such ambitious projects has taken longer than anticipated. In spite of this, in the coming years, we expect to receive increased interest from developing regions and grow the portfolio of climate project proposals.”

“Future Fund-Progress” report – The Climate Group, 2017.

## Assessment of actions by regions

Since 2015, the Climate Group and CDP have published an annual report assessing the actions and progress made by the regions, the “[Annual Disclosure report](#)” (formerly “Compact of States and Regions”<sup>7</sup>), and we have summarised its principal findings in the table below. **Not all regions which publish their data belong to the Under2 Coalition and these results consequently relate to all regions reporting to CDP.** Consequently, in 2017, out of a total of 110 regions, 53 members of Under2 MoU published their emissions through CDP. Furthermore, in 2017, CDP created two new tools to improve the management and transparency of the emissions data provided by regional governments:

The [Climate Tracker](#) for states and regions is a tool designed to facilitate decision-making and data management, by allowing users to view emission trajectories on the basis of reported emissions, following planned or implemented targets and actions.

The [Climate Analytics Navigator](#) for states and regions allows emissions data to be compared and inventories to be developed amongst the local authorities which report their emissions.

	REGIONS REPORTING THEIR EMISSIONS	INHABITANTS REPRESENTED IN MILLIONS	REPRESENTED EMISSIONS *	NO. OF EMISSION-REDUCTION GOALS PUBLISHED**			AVERAGE REDUCTION IN EMISSIONS COMPARED WITH THE BASELINE YEAR	ACTIONS
				2020	2030	2040		
2015	44	325	2,8 Gt CO <sub>2</sub> eq	77			6%	348
				28%	12%	22%		
2016	62	440	3,1 GtCO <sub>2</sub> eq	105			6.3%	1,299
				32%	17%	26%		
2017	110 (including 53 from Under-2MoU)	658	3,9 GtCO <sub>2</sub> eq	140			8.5%	2,329
				66%	38%	55%		

TABLE 1. REPORTING BY MEMBERS OF THE COMPACT OF STATES AND REGIONS 2015-2018.

(Source : [Annual Disclosure – The Climate Group / CDP](#))

\* Only including members having reported their emissions.

\*\* The total number of goals includes other targets such as 2018 or 2060.

<sup>7</sup> The Compact of States and Regions was the name given to the reporting mechanism created in 2014 by nrg4SD, the Climate Group and R20, using CDP as a joint reporting platform.

In 2015, the authors of the report estimated that 76% of members were recording an emissions reduction of, on average, 6% compared with the chosen baseline year. In 2017, the number of committed regions increased significantly, with a growing average reduction of 8.5%. In 2017, six governments exceeded their 2020 targets – Lombardy, Catalonia, Carinthia, Wallonia, Provence-Alpes-Côte-d’Azur, and Madeira – and 12 had reduced their emissions by more than 20% since their baseline year.

In the Annual Disclosure 2018, the 56 governments that disclosed their latest inventories (reaching 120 in total since 2015), 70% of them are currently, on average, 20% below their base year emissions. Across all governments, average emissions reduction is 9% since base year.

It is important to note that these are voluntary targets which can vary in terms of baseline years and emissions scenarios, or in whether they seek to reduce carbon intensity or emissions in absolute terms (for example, become carbon neutral by 2050). The monitoring of this progress is important insofar as CDP, on the basis of the 2017 scenarios provided by the International Energy Agency (IEA), estimates that if the regions meet their targets there will be an additional reduction of 0.3 GtCO<sub>2</sub>eq by 2020 in comparison with the trajectories calculated on the basis of national commitments, and, by 2050, an aggregated-emission saving of 21.9 GtCO<sub>2</sub>eq (States and Regions Climate Tracker, 2018).

Logically enough, 60% of states and regions reporting their missions are European or American (see Figure 8), precisely where many members of the Global Covenant and cities reporting to CDP are already located.

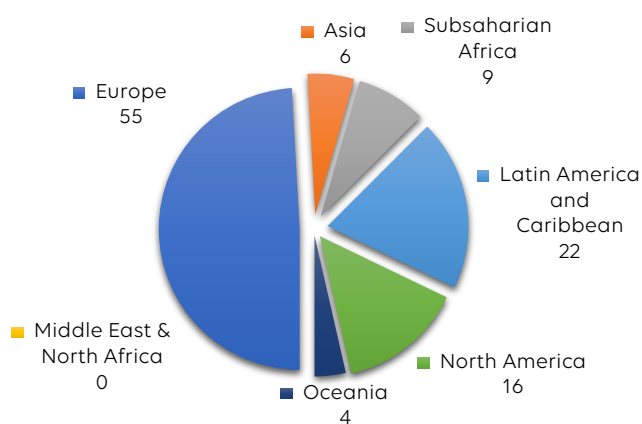


FIGURE 8. GEOGRAPHICAL DISTRIBUTION OF REGIONS REPORTING THEIR EMISSIONS TO CDP IN 2017

(Source : [CDP Database 2017](#)).

Regions	Population	Emissions in 2015 (tCO2eq)	Base Year Emissions (tCO2eq)	Evolution emissions
Alberta (Canada)	4,252,900	274,100,000	232,800,000 (2005)	+ 17 %
Andalusia (Spain)	8,393,575	48,746,778 (2016)	65,911,936 (2005)	- 26 %
Lombardia (Italia)	10,008,349	76,400,000	91,603 (2008)	- 16.6 %
Basque Country (Spain)	2,171,886	19,363,627	25,668,646 (2005)	- 24.6 %
Queensland (Australia)	4,808,771	153,004,000 (2016)	171,567,000	- 10.8 %
North Rhine-Westphalia (Germany)	17,870,000	285,388,000	367,000,000 (1990)	- 22.2 %
Scotland	5,300,000	41,481,092 (2016)	72,150,000	- 42.5 %
Wales	3,099,086	45,698,896	56,620,000 (1990)	- 19.3 %
Wallonie (Belgium)	3,589,744	36,125,000	55,999,000 (1990)	- 35.5 %

TABLE 2: EXAMPLE OF EMISSIONS TRENDS OF THE REGIONS.

(Source: CDP Database 2017 States and Regions GHG Emissions; regions and states website and official data)

More results from state and regions are available in the annex of the 2017 annual report of the Climate Group « [Annual Disclosure 2017 – Annex](#) »

Effectively, 2,300 actions have been reported by the regions to CDP, and a large majority of these projects are already in progress. Members are concentrating their actions mainly on the construction, energy and transport industries and a large majority of these projects are already in progress (See Figure 9).

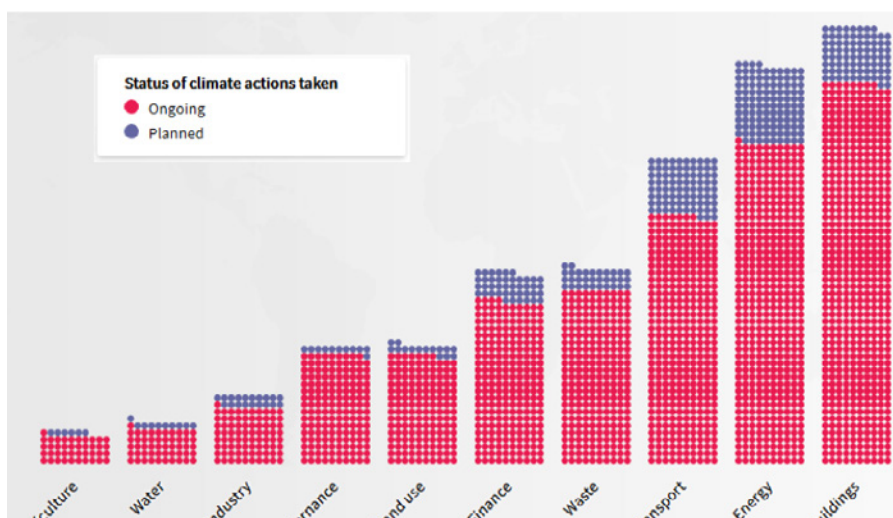


FIGURE 9 - ACTIONS REPORTED BY STATES AND REGIONS TO CDP, BY SECTOR AND STATUS.

(Source : States and Regions Climate Tracker).

# Initiatives led by local authority networks

## A. LOCAL GOVERNMENTS FOR SUSTAINABILITY - ICLEI

### Background and composition in 2018

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ICLEI-Local Governments for Sustainability (ICLEI) is an international non-governmental local-government organisation (cities and regions) founded in 1990, sponsored by the United Nations Programme for the Environment (UNEP) whose World Secretariat is based in Bonn, in Germany. Its funding depends partly on contributions from its members and mainly on partnerships with national governments (particularly Germany), the European Union, the UN, and other international organisations and NGOs. The organisation offers local governments various types of support, which translates into nearly 130 different activities including training, advice, a members' platform for collaboration and exchange, as well as acting as a catalyst for funding territorial projects.

These programmes support the implementation of international covenants and programmes (Agenda 21, the New Urban Agenda, etc.) in territories placed under the responsibility of nine Regional Secretariats (Central America and the Caribbean, North America, South America, Africa which hosts the Biodiversity Centre, CBC (part of ICLEI), East, South and South-East Asia, Europe, Pacific), five national offices (United States, Canada, Japan, Korea, Indonesia), a capacity-building centre in Kaohsiung, Chinese Taipei, and a South India office in Hyderabad. In 2018, four new offices opened: a Quebec office in Montreal, an office for British Columbia, in Canada, in the city of Victoria, a national office in Beijing and finally, a regional office in Colombia for the Aburrá Valley. Also, Brussels, Belgium and Berlin, Germany each have an ICLEI office for liaison with the European institutions and the German government respectively.

**On 1 September 2018, ICLEI had 813 members in 91 different countries.** As part of its different activities, ICLEI also works with more than 800 additional local governments, and this allows it to impact more than 20% of the global population and more than 25% of the global urban population..

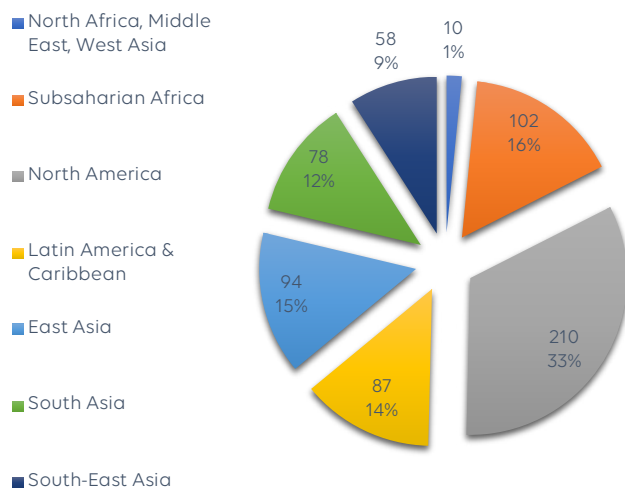


FIGURE 10. GEOGRAPHICAL DISTRIBUTION OF ICLEI MEMBERS

(Data : [World Secretariat](#))

## Update on projects and programmes

• **FINANCING AND INSURANCE** • The [Transformative Actions Program \(TAP\)](#): this programme, launched in 2015, aims to act as a project incubator to catalyse and improve capital flows to cities, towns and regions, thereby accelerating low-to-no emission and climate-resilient development to support national ambitions through *transformative*<sup>8</sup> local infrastructure projects. By using the TAP, local and regional governments can benefit from an integrated range of tools: project-preparation facilities (PPF), platforms, advocacy. Likewise, the growing TAP partnership serves these local and regional governments, offering their specific plethora of guidance and support within a cohesive framework. The TAP serves Local and subnational governments, and/or their project partners. The condition is that the local or regional government must be a key stakeholder in the project and the project is pre-approved in writing by the local / regional government (e.g. part of the Climate Action Plan). These projects then receive "TAPprouval" certification.

Since its first call in May 2015 and the announcement of a growing pipeline at COP21, the TAP, has been followed with great interest by local and regional governments, as well as national governments and the finance and development communities. A total of 124 projects from 41 countries - equally representing the Global South and Global North - were submitted to the TAP in 2015. These projects related to a variety of domains linked to low-carbon transition (48), waste management (15), transport (13) and adaptation (12). **The investment requirement for these projects is approximately \$ 9 billion, demonstrating the urgent need for funding in the territories.** ICLEI facilitated these projects and their sponsors with funders and partners at events organized by ICLEI, with the [LoCal Matchmaker](#), tool, created by ICLEI and the CDP (financed by Climate KIC), or from banks and the ministries of the countries of origin of the project, via the Global Covenant of Mayors or the Cities Climate Finance Leadership Alliance - CCFLA (see glossary). Ten TAP projects were selected in 2017 by the Cities Alliance, and benefited from the free Global Infrastructure Basel (GIB) [SmartScan](#) tool to assess the economic, social and governance risks of their project.

The second TAP call, announced in September 2018 at the Global Climate Action Summit (GCAS) in San Francisco, retains its main objective: enabling and supporting local and regional governments to access climate finance and project preparation support. The support focus has however

<sup>8</sup> The definition of "transformative" action refers to an action that contributes to tackling climate change (low-emission development, mitigation, adaptation and/or resilience, access to secure, affordable and sustainable energy). It supports systematic and sustainable change at the community level, with the potential for large-scale impact and scalability.



shifted to early stage project-screening and connecting the pipeline to other PPFs and support services offered by the TAP partners<sup>9</sup>. Effectively, the first call showed that the services offered by TAP partners did not appear to be sufficiently suitable at the time for the development of major urban projects. TAP strongly builds on ICLEI's own capacities and services along with the support of its renewed and new partnerships. Partners either commit financially or technically are actively involved in the TAP Services, ensuring that transformative project ideas are supported from the project identification phase, and therefore become financeable, robust and investor-friendly projects.

Furthermore, the [Insurance Industry Development Goals for Cities](#) were published by ICLEI and UNEP at the ICLEI World Congress in 2018. These ten goals aim to guide the work of insurance companies with local authorities particularly in terms of the prediction and management of natural disasters, the health effects of pollution, the preservation of cultural and natural heritage and infrastructures. They should also further the implementation of SDG 11 and build "inclusive, safe, resilient and sustainable" cities.

• **LOW-CARBON TRANSITION** • [Projet Urban-LEDS](#) (Urban Low Emissions Development Strategy): the objective of this project, funded by the European Union, is to contribute to the reduction of greenhouse gas emissions by the promotion of Urban Low Emission Development Strategies (Urban LEDS) in cities/towns in emerging economies and least developed countries. The project recognises that human activity in cities contributes a significant and growing proportion of global greenhouse gas emissions, driving the demand for energy and other services in urban areas with rapid population growth. Meeting the goals of the Paris Agreement requires a fundamental transformation of how urban infrastructures and services, such as transport, energy, water, waste and urban space, are planned, delivered and maintained. It will also require effective monitoring, reporting and tracking of performance. Urban-LEDS II aims to contribute to this vital component of international climate action, with a focus on local needs and the role of all levels of government to enable action.

**Phase II 2017-2021 of this ICLEI flagship project, with a budget of EUR 8 million, aims to offer support to more than 70 cities in the four countries participating in phase I of the project (Brazil, India, Indonesia and South Africa), four new countries (Colombia, Laos, Bangladesh and Rwanda) and in Europe.** The aim is to consolidate the achievements of the cities in question and to continue the implementation of their action plans. These cities will be supported in developing or updating an "Urban-LEDS strategy" and an action plan to cut emissions, with the focus now on adaptation co-benefits and their implementation. The project also seeks to build the capacities of workers in the cities (training, peer exchange, etc.) and to promote the integration of their climate plans into their state or region's actions framework (vertical integration of climate policies), with a view to improving reporting by the cities and their access to funding for implementing NDCs.

Nationally, the project will explore and support enhanced vertical and national integration (multi-level governance) of climate action in support of national and local strategies and policies under the framework of the Paris Agreement, through enhanced climate-change reporting in Nationally Determined Contributions and support for local authorities' access to climate financing.

At the global level, the project will help to support systems for the measurement, reporting and verification of the climate actions of the cities in line with national systems and argue for

<sup>9</sup> UN-Habitat; Global Infrastructure Basel (GIB) Foundation; Global Fund for Cities Development (FMDV); European Investment Bank (EIB); R20 Regions of Climate Action (R20); Sustainable Infrastructure Foundation (SIF); C40 Cities Climate Leadership Group (C40); Cities Alliance.

local governments to be included in international climate frameworks. International, regional and national cooperation between states and cities in urban climate action is encouraged, while at the same time the Covenant of Mayors on climate and energy is promoted as a key world initiative for local governments.

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### **Results of Phase I of the Urban-LEDS Project**

The first 2012-2015 phase led by ICLEI and UN-Habitat guided and supported eight model cities to develop comprehensive “Urban LEDS strategy”, and their implementation plans using the ICLEI’s [GreenClimateCities \(GCC\)](#) methodology: Fortaleza and Recife in Brazil, Rajkot and Thane in India, Balikpapan and Bogor in Indonesia, KwaDukuza and Steve Tshwete in South Africa. 21 additional “satellite” cities benefited from the capacity building of the pilot cities, particularly with the participation of eight European cities which provided technical assistance.

These strategies have been included in development planning and design via new policies and laws. Local pilot projects on the use of sustainable energy – energy efficiency and renewable energies – have been successfully implemented. The project contributed to the development of a new monitoring, reporting and verification (MRV) process for local climate action, to capacity building and infra-national actions in the area of climate change and has enabled new dialogues to be opened on vertical integration (multilevel governance) with the countries involved in the United Nations Framework Convention on Climate Change (UNFCCC).

The [final Urban-LEDS report](#) lists **the implementation, between 2012 and 2016, of more than 60 pilot projects, 447 climate actions, including 334 mitigation actions and 113 adaptation actions. Furthermore, 30 of 31 participants produced an emissions inventory**, which was then reported to the carbonn® Climate Registry representing in total 79 MtCO<sub>2</sub>eq. Finally, the project provided several opportunities for exchanges (seminars, training, etc.) between the pilot cities themselves and with partner European cities.

TEXT BOX 5

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[Solution Gateway](#) is an online resource platform for local governments developed under the Urban-LEDS project. The platform operates as a catalogue of low-carbon solutions in different sectors and provides a range of advice in the areas of public policy, regulation, technical expertise, good practices, awareness-raising tools, etc. It currently offers online 23 Solutions by sector, 8 Solution Packages by theme which each offer a range of solutions designed to promote synergies between actions and maximise long-term effects, and finally 94 case studies with a quantified analysis of the implementation of these solutions. “LED Street Lighting Solutions Package and training”, a new package developed in collaboration with Signify, will shortly offer a guide and training to improve public lighting and its energy efficiency, accompanied by two case studies.

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## **Support for the Sustainable Energy for All (SEforALL) accelerators' platforms**

Several of these Solutions support the SEforALL "accelerators", particularly these two platforms for which ICLEI provides the reporting platform.

**District Energy in Cities Initiative** : This initiative, created in 2014 by UNEP and SEforALL, seeks to accelerate the low-carbon transition of the energy systems of districts of emerging or developing cities. It produced significant results in 2017: 62 cities in 34 different countries benefited from assistance and technical and public policy tools provided to develop or renew the energy systems in their districts. The initiative recorded investments of EUR 17.8 million in energy efficiency and renewable energies in Bosnia-Herzegovina, the first urban cooling project in Thane, India and collaboration between the cities of Barcelona and Temuco (Chile) and between Copenhagen and Astrakhan (Russia).

**Building Efficiency Accelerator (BEA)** : This platform promotes public-private collaboration in constructing low-carbon buildings. 253 cities benefited from phase I (2015-2017) via the organisation of nine events worldwide and 18 local events, and 21 webinars followed by more than 1,000 participants. Phase II 2018-2019 seeks to extend the platform's network and to strengthen partnerships with cities by developing private sector engagement and coordination with national policies, and by facilitating the support and financing of projects.

TEXT BOX 6

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[The Urban Transitions Alliance](#) is an initiative launched in 2017, financed by the Stiftung Mercator<sup>10</sup> and managed by ICLEI. It seeks to support industrial cities in transition by identifying their shared challenges and facilitating collaboration and exchanges of solutions in the areas of energy, mobility, infrastructure and social transition. It currently has 11 members Pittsburgh, Cincinnati, Buffalo and Baltimore in the United States, Essen, Dortmund, Gelsenkirchen in Germany, Katowice in Poland, Beijing (two districts) and Shijiazhuang (Yuhua district), in China. After the first assembly of industrial cities under the aegis of the TWINS Conference Ruhr and the UN Climate Change conference COP23 in November 2017, Urban Transitions Alliance members met once more during the Forum for Cities in Transition in June 2018, at the ICLEI World Congress in Montreal.

[The Ecomobility Alliance](#), launched in 2012, is now a network of 23 cities worldwide committed to making their transport systems more sustainable, by prioritising walking, cycling, public transport and car sharing. The report for the 2016-2017 period shows that, in member cities, 5,565 km of cycle tracks were added and 72% of members ran a bicycle-sharing system. Several of the projects run by these cities have been awarded prizes for their transport programmes, highlighting the attention they pay to integration, accessibility, safety and energy efficiency in their public transport systems.

• **RESILIENCE AND ADAPTATION** • Recently ICLEI has launched several programmes related to adaptation and resilience in cities:

- The "[Frontline Cities and Islands](#)" project (in collaboration with the Global Island Partnership) provides mayors with tools to reduce the risks of natural disasters and build their capacity to implement replicable projects.

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<sup>10</sup> Stiftung Mercator is an independent, private German foundation. It seeks to strengthen Europe by improving integration through equal educational opportunities for everyone, to drive forward the energy transition as a trigger for global climate change mitigation and firmly anchor cultural education in schools.

- The [CITYFOOD](#) network (with the RUAF Foundation) meets the needs of local governments to improve their knowledge of local and regional food systems and ensure that their food policies meet environmental (land degradation, adaptation) and social (employment and nutrition) challenges. The network now has 22 members, including six cities in the Philippines and three cities in Portugal.
- [CitieswithNature](#) is a platform for knowledge-sharing launched by ICLEI, The Nature Conservancy and IUCN at the ICLEI World Congress in June 2018, open to all local governments to exchange information on good practices they have used enabling better interaction between urban and natural ecosystems.
- Since 2011, ICLEI has organised [The Resilient Cities congress in Bonn](#), Germany. In 2018, the 9th annual conference, the key themes of which were digitalisation and the protection of heritage and multilevel governance, attracted 400 participants from 48 countries, with representation from 89 local governments. As an official Cities and Regions Talanoa Dialogue event, the 9th edition of Resilient Cities attempted to answer the three main questions of where we are, where we want to go, and how we get there in achieving a resilient and sustainable urban future. To learn more about the session, refer to the Resilient Cities [Report 2018](#).»

## B. C40 – CITIES LEADERSHIP GROUP

### Background, mission and status of commitments in 2018

C40 is a network of the world’s megacities created in 2006 by the former Mayor of London, Ken Livingstone. The organisation’s headquarters is in London and it is presided by the current mayor of Paris, Anne Hidalgo. It is mainly financed through foundations, in particular donations from Bloomberg Philanthropies, the Children’s Investment Fund Foundation and Realdania. Michael Bloomberg is President of the C40 Board of Directors.



FIGURE 11. GEOGRAPHICAL DISTRIBUTION OF C40 MEMBERS.

(Source : C40 website)

The organisation started with 40 members, a number that grew to 80 during COP21 in 2015 and now contains, **in the first six months of 2018, 96 cities throughout the world, with 650 million inhabitants (8.3% of the world population). These cities have significant economic weight and account for 25% of the global GDP.**

Abidjan, the host city of the Climate Chance Summit Africa 2018, joined the C40 network in April 2018, at the same time as Guadalajara (Mexico), Fuzhou and Zhenjiang (China).

## Emissions of the C40 cities

The C40 launched its own online [dashboard](#) to view the data emissions of the 55 cities in its network which report their emissions. By including scopes 1, 2 and part of scope 3 on waste (see Section 3 on the description of methodologies), the 55 C40 cities appearing on the dashboard each year emit a total of 996 MtCO<sub>2</sub>eq and on average 18 MtCO<sub>2</sub>eq. The gap between the cities is extremely wide with New York and Tokyo far ahead respectively accounting for 67.5 and 66 MtCO<sub>2</sub>eq of emissions per year, and Basel (Switzerland) with 0.85 MtCO<sub>2</sub>eq per year. 50% of these cities reporting their emissions emit less than 10 MtCO<sub>2</sub>eq per year (See Figure 12).

A reading of these reports of C40 cities emissions contradicts a belief strongly held by general opinion: cities of the North are not necessarily those with the greatest amount of global emissions (Scopes 1 and 2). Although large cities in the northern hemisphere, such as Tokyo, New York and London, remain amongst those cities with the largest emissions, numerous cities in emerging countries, such as Lagos, Tshwane and Lima, report higher emissions than cities in more advanced countries, particularly due to high emissions in the transport and energy-production sectors. There is therefore very significant potential for emissions reduction in cities classed as being in the south, and efforts taken in the coming years will therefore be more strenuous in this area. Clearly, here we refer to direct emissions from urban activities (housing, transport, etc.), but if we include emissions linked to consumption, travel (particularly by air), the inhabitants of cities in the North remain much greater emitters of CO<sub>2</sub>. Finally, not all cities report the same emissions sectors, and only 17 cities have calculated their emissions caused by “industrial processes and product use”, and 12 cities have calculated those due to agriculture, and land use. On the basis of the common core of emissions sectors covered by these 55 cities, including emissions from stationary combustion, transport and waste (see Section 3 on methodologies for calculating emissions), we can see that 62% of the emissions of the C40 cities are due to stationary combustion, 29% to transports and 9% to waste.

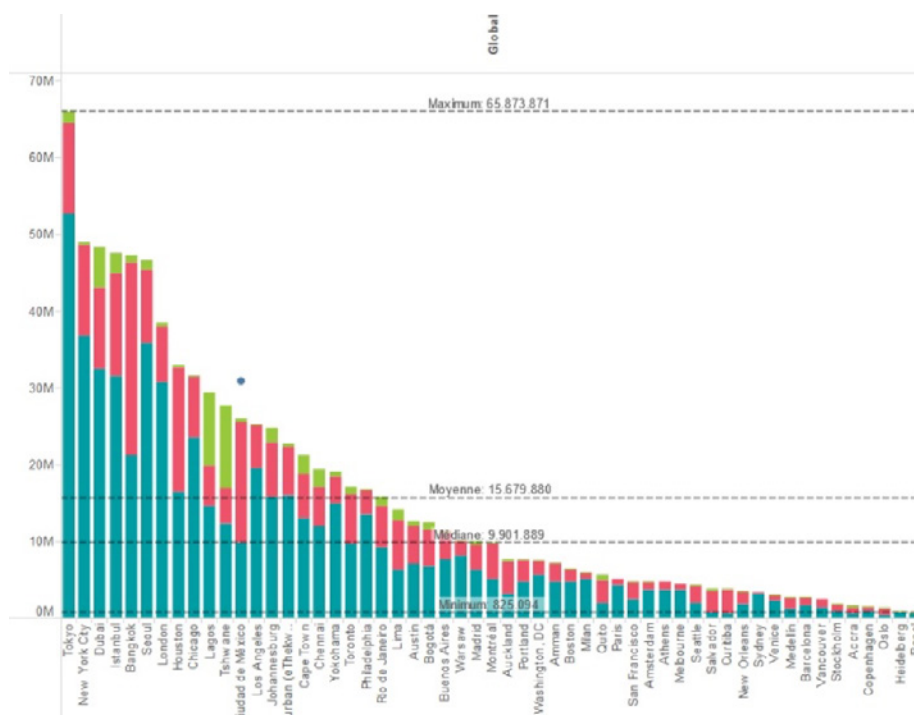


FIGURE 12. TABLE OF EMISSIONS OF C40 MEMBERS (SCOPES 1 AND 2).

(Source: dashboard C40)

The "[27 C40 Cities have peaked their greenhouse gas emissions](#)" study, published in 2018 during the GCAS, found that 27 of the largest cities in the world, accounting for 54 million urban citizens and a GDP of USD 6 billion, peaked their greenhouse gas emissions between 1990 and 2013. The compilation carried out by the C40 notes that these cities have seen their emissions levels fall over a 5-year period, and they are now at least 10% lower than the highest values observed. It further notes that these 27 cities have recorded this reduction of 2% on average per year at the same time as their populations have increased by 1.4% per year and their economies by 3% per year on average.

For the C40, these cities have reached a crucial milestone, as demographic growth has increased, and urban economies have expanded. The 27 cities cited in this inventory are Barcelona, Basel, Berlin, Boston, Chicago, Copenhagen, Heidelberg, London, Los Angeles, Madrid, Melbourne, Milan, Montreal, New York, New Orleans, Oslo, Paris, Philadelphia, Portland, Rome, San Francisco, Stockholm, Sydney, Toronto, Vancouver, Warsaw and Washington D.C. Nevertheless, this report implicitly suggests that still very few cities provide regular emissions inventories, and that these interesting results remain concentrated in Europe, North America and Australia. In publishing these results, the C40 decided to focus on a few flagship examples of reductions in sector-based emissions.

**Copenhagen**, which had peaked its emissions in 1991, appears to have reduced its heating energy needs by 70% since that time through introducing a city-wide heating system, and pooling heat produced by industry and wastewater treatment.

**San Francisco** peaked its emissions in 2000 and has since concentrated its efforts on reducing electricity consumption (30% of the energy used by the city) particularly in the construction industry. Furthermore, the city, which produced an ambitious target of consuming solely renewable electricity by 2030, has worked actively with the entire electrical industry and closed two of the most polluting fossil-fuel power plants in its territory, achieving, in 2017, the generation of 77% of its electricity consumed from renewable sources.

**Tokyo** has decided to control its production of electricity while at the same time following a stringent energy-efficiency policy. Tokyo, upon entering the carbon trading system for cities, imposed, in 2010, extremely severe reductions in emissions on the construction industry, leading energy consumption to be reduced by 21% compared with 2000 and total GHGs by 7% compared with 2003.

**Paris** reduced its emissions from transport by 39% between 2004 and 2014, through a proactive policy extending public transport and soft modes of travel such as by bicycle.

**Sydney** has reduced its emissions by 20% since 2007, particularly due to a very sharp fall of 80% in the energy consumption of buildings, due to the introduction of a wide range of programmes, subsidies and incentives to improve the energy performance of buildings.

Finally, **Vancouver** reduced the amount of waste sent to landfills by 23% between 2007 and 2016, at the same time as its population increased by 10%, and this caused a reduction of 65% of emissions from the landfill sites. The main levers used by the city to achieve these outcomes included promoting large-scale composting and an effective landfill gas collection system.

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## When the interpretation of consumption habits modifies perception

In a study published in March 2018 "[\*Consumption-based GHG emissions of C40 Cities\*](#)", the C40, in collaboration with several universities, measured the greenhouse-gas emissions produced by the consumption of the residents of 79 cities in its network. The study found that, in 2011, the emissions produced by consumption in these 79 cities amounted to 3.5 GtCO<sub>2</sub>eq, 60% higher than the emissions from production by local activities in the same cities which was estimated at 2.2 GtCO<sub>2</sub> (an indicative figure arrived at by aggregating inventories carried out at different times between 2011 and 2015). Of these 3.5 GtCO<sub>2</sub>, one third was due to the consumption of energy, goods and services produced in the territory and two thirds due to imports. This consumption-based approach, albeit indicative, further highlights scope 3 emissions (from importing goods and services) and shows, in this case, that imported emissions are equivalent to emissions produced in the territory. The study further estimates that these consumption-based emissions, in 80% of the cities included in the study, are higher than emissions from the production sector, particularly in Europe and North America, where these consumption-based emissions are on average 3 times higher than production-based emissions. The 20% of cases, where production-based emissions exceed consumption-based emissions, are located in Asia and Africa and are what are known as "producer" cities.

These results naturally reflect the modes and nature of consumption and production, and the distribution of purchasing power between cities worldwide, confirmed by inhabitants per capita emissions which are on average higher in the C40 cities (10.7tCO<sub>2</sub>eq/capita compared with an average 8.7 tCO<sub>2</sub>eq/capita worldwide) and in European, North American and Pacific cities (between 10 and 25 tCO<sub>2</sub>eq/capita). Consequently, consumption-based emissions require just as much attention from local authorities committed to their territory's ecological transition or to carbon neutrality, particularly as the levers for action (production chain, local food systems) available to act on these volumes frequently have a higher potential for global impact.

TEXT BOX 7

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## Update on 2018 programmes

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The network provides these cities with an important collaboration platform for the sharing of knowledge and expertise between its member cities. From this perspective, the organisation is engaged in some ten [programmes](#) to support cities in formulating, implementing and financing projects and also collecting and providing access to data, planning, research, etc.

**Capacity building and technical support:** The “Climate Positive Development Program” is currently supporting 18 large-scale projects whose building operations and stages should achieve a net negative greenhouse gas emissions balance, by acting on transport, energy and waste and compensating their emissions by reducing those of neighbouring communities. The C40 also provides direct support to cities via the City Advisers programme which funds several dozen technical adviser positions. Beneficiary cities are selected as part of a call for applications based on need and potential impact in the fight against emissions. 10 cities were selected after a first call in 2014. Finally, in the area of **Data Management**, the “City Intelligence” programme seeks to improve data collection and analysis.

**Access to financing:** the “Financing Sustainable Cities Initiative” programme seeks to improve the design of projects and public policies in order to facilitate investment. It involves an annual Forum, workshops designed for officials in C40 cities, and a platform enabling communication about the most effective financing models made available to all relevant actors (cities, investors, etc.). The C40 Cities Finance Facility (CFF), funded by the German and American governments, supports project preparation and training in emerging and developing cities and improves their awareness of financing instruments. Launched in 2015, it is responsible at present for two projects, a cycling infrastructure project in the city of Bogotá and an electric bus corridor project in Mexico City.

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### Accelerate the adaptation of major world cities

The C40 also coordinates 17 thematic networks enabling cities to showcase their projects or find technical support to initiate them. These networks include 3 platforms for the exchange of knowledge and good practices with a view to improving the adaptive capacity of cities faced with urban flooding, managing heat islands, and coping with the specific difficulties of cities located on deltas. These last two platforms produced good practice guides published in 2016.

Finally, in 2018, the C40, with GCOM, Acclimatise and the Urban Climate Change Research Network launched a scientific collaborative project *The Future We Don't Want* to highlight, in a series of thematic case studies supported by facts and figures, the number of cities and their inhabitants who are exposed, at present, or will be by 2050, to the impacts of six major climate risks.

TEXT BOX 8

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## C. THE NETWORK OF REGIONAL GOVERNMENTS FOR SUSTAINABLE DEVELOPMENT (NRG4SD) AND REGIONSADAPT

### Background and composition

Launched in 2002 at the World Summit in Johannesburg, the Network of Regional Governments for Sustainable Development – nrg4SD – consists of more 50 subnational governments and associations of subnational governments from 30 countries worldwide. By joining the network, member regions accept the nrg4SD founding [Déclaration de Gauteng](#), as well as the payment of annual membership fees based on a solidarity principle through which the network is financed. The organisation also serves a representation at UN negotiations, European Union initiatives on climate change, biodiversity, and the 2030 Agenda for Sustainable Development.

On the basis of a “networking method” (facilitation of mutual learning, knowledge exchange, creation of partnerships, etc.), nrg4SD achieves decentralised cooperation among its members and the creation of a like-minded community of practice. It helps its members strengthen their international influence and local governance capacities in regard to several sustainable development themes. Specifically, the network supports and co-funds exchanges of expertise, partnerships and cooperation projects among its members, and with international partners. **Thereby, the network helps its members to deploy and strengthen planning and territorial governance tools in its three sectors of activity: biodiversity, inclusion of SDGs and adaptation to climate change.**

### RegionsAdapt

RegionsAdapt was launched in December 2015 at COP21 by the governments of Catalonia and Rio de Janeiro state and is nrg4SD’s flagship initiative on climate change, focused on adaptation. This initiative, open to regional governments (or any intermediary government), was initially composed of 27 members and now has 70, including 5 national associations of regions.

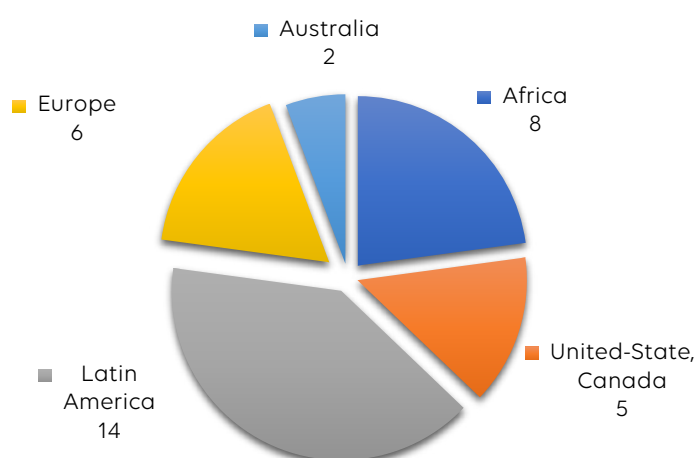


FIGURE 13. GEOGRAPHICAL DISTRIBUTION OF REGIONSADAPT MEMBERS. SOURCE: REGIONSADAPT DATA.

(Source : Données RegionsAdapt)

While the nrg4SD acts as the secretariat to the RegionsAdapt, regions joining the initiative do not necessarily have to be nrg4SD members as well.

By joining the RegionsAdapt initiative, regions commit to:

- to adopt a strategic approach to adaptation and prioritise adaptation action within two years of joining;
- to take concrete action on adaptation in at least one of the seven key priority areas identified by the regions;
- to report data on the progress of the adaptation actions on an annual basis through CDP’s states and regions platform.

Finally, with a view to assisting in building the operational capacity of member states and regions to fulfil these commitments, RegionsAdapt organises working and discussion events in the form of 6 thematic working groups, 25 online meetings and 9 webinars. At the end of each year for the two years that the project has existed, nrg4SD has published an annual report assessing, on the basis of actions reported on the CDP platform, qualitative and quantitative trends in the regions’ exposure to climatic risks, and reported adaptation measures adopted. In 2017, 35 of 69 members of RegionsAdapt representing 223 million inhabitants, had testified, in the “risks and adaptation section” of CDP to their vulnerability to 19 physical risks from climate change (Figure 14).

**Mirroring the geographical distribution of nrg4SD members (Figure 13), Latin American and African states and regions are those which provide the most reporting. In essence, these results already show, for each type of identified risk, which of the 200 reported adaptation measures are the most frequently used by states and regions.**

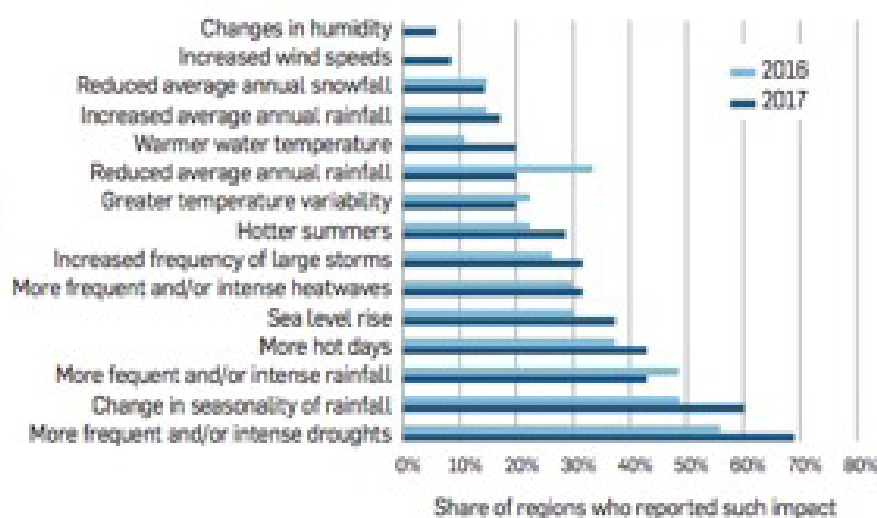


FIGURE 14. TYPES OF CLIMATE RISKS REPORTED BY THE PARTICIPANT REGIONAL GOVERNMENTS.

Source : RegionsAdapt 2017 Report

In the last [RegionsAdapt 2017](#): report, “Regions accelerating climate change adaptation”, nrg4SD offers an initial overview of action taken by the 27 founder members who had two years to honour their commitments. **Only 5 of those regional government still remain to adopt an adaptation plan; all have taken at least one action in one of the priority areas and only 3 have provided no reporting since 2015.** Considering the progress made by these founding members, RegionsAdapt put forward four new commitments which seek to deepen, during the 2018-2019 and 2020-2021 periods, the strength and scope of adaptation measures and the quality of reporting. The nrg4SD nonetheless

identifies progress that could be made in the scope of coverage of the physical risks identified by the regions, since only 68% have been the target of an adaptation measure. The report highlights the many obstacles, such as a lack of human and financial resources and an absence of cooperation with other regional governments, which could hamper members' adaptation actions.

## D. EUROPEAN NETWORK SPECIALISING IN ENERGY/CLIMATE ISSUE

### Energy Cities

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Energy Cities is the European Association of Local Authorities in Energy Transition, created in 1990 and based in Brussels (Belgium) and Besançon (France). Since 2017, Energy Cities has been under the Presidency of the City of Heidelberg (Germany) with a Board of Directors of 11 European cities. The Association seeks to build the competencies of local authorities in the area of sustainable energy, represent their interests to the European Union, and act as a platform for sharing experiences in order to successfully implement projects. It is a member organisation of the European Covenant of Mayors consortium for climate and energy.

As in the case of the Covenant of Mayors, membership of the Association was rapidly extended to neighbouring countries with several members in Morocco, Turkey and Israel. **Energy Cities represents more than 1,000 local authorities in 30 countries**, mainly municipalities, but also inter-municipal structures, local energy management agencies, municipal companies and groups of municipalities. Almost 500 good practices **of Energy Cities members have been disseminated on the association's website**. A large proportion of these members belongs to almost 30 European initiatives, including the Covenant of Mayors, European Mobility week, Display, etc.

### Climate Alliance

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**• MISSION AND COMPOSITION •** Climate Alliance is an association of European local governments created in 1990 and a member of the European Covenant of Mayors consortium. Its activities are linked to mitigation and adaptation to climate change as well as the protection of ecosystems of the indigenous peoples of tropical forests. Indeed, "COICA", the umbrella organisation of the indigenous peoples of the Amazon has a seat on its Executive Board for this purpose. Climate Alliance has six national coordination offices (Austria, Germany, Hungary, Italy, Luxembourg, Switzerland), an office for liaison with the European Union, and its Secretariat is based in Frankfurt (Germany).

Members of the Alliance commit to reduce their CO<sub>2</sub> emissions every 5 years, halve their per-capita emissions by 2030 (compared with 1990), preserve tropical forests by avoiding the use of tropical wood and support the projects of their partner indigenous peoples. For this purpose, the Association supports its members in developing CO<sub>2</sub> emissions measuring tools, conducts local authority campaigns and European Union advocacy actions, and facilitates exchanges between members and the completion of their projects.

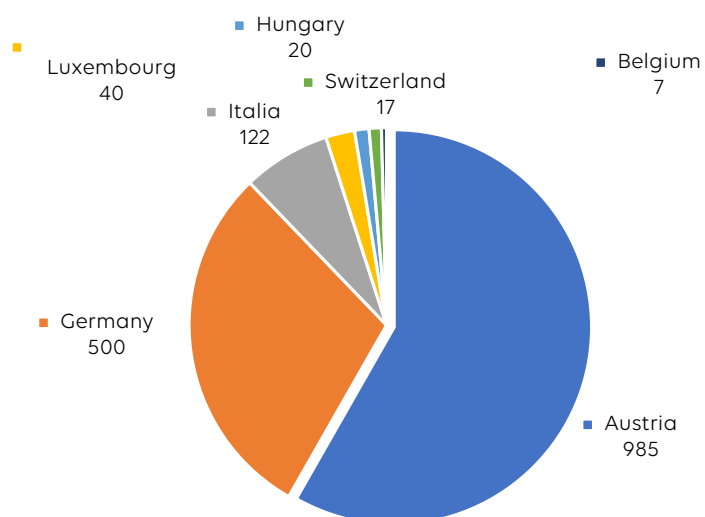


FIGURE 15. NUMBER OF MEMBER LOCAL AUTHORITIES PER COUNTRY (MAY 2018).

(Source: [Climate Alliance website](#)).

In May 2018, the Association had **1,723 members in 26 European countries, including 1,654 municipalities and 26 provinces and regions. Between 2015 and 2018, 91 new members joined the Association. 86% of these members are located in Austria and Germany, and more than 98% are in one of the six countries currently hosting a national office.**

**• PROJECTS AND PROGRAMMES: 2018 RESULTS •** The Alliance has provided several tools and platforms to help its members monitor their commitments. For example, the “[Climate Compass](#)” helps European local authorities track local activities in progress in their territories and measure their impact and, on this basis, offers analyses and recommendations. The “[Carbon Calculator](#)” allows Ukrainian and Georgian local authorities to monitor their greenhouse-gas emissions. There is also “[RADar!](#)”, an online platform that allows local authorities and cyclists to work together, with cyclists able to pinpoint problems they have encountered with a view to facilitating the management of bicycle paths on a daily basis. It is currently used by more than 265 municipalities, mainly in Germany. Others also provide methods for observing conditions at district level ([Repowermap](#)), or provide platforms for supplying information about energy cooperatives in Europe and facilitating citizen investment ([citizenergy](#)).

### ***Increase opportunities for private-sector financing***

[FALCO](#) (Financing Ambitious Local Climate Objectives) has built on the results of several previous financing-related projects in more than 180 Flemish municipalities which are signatories of the Covenant of Mayors. This project, which has been funded by the European Union for the 2017-2021 period, seeks to use government funding to leverage private funds. This method, unlike the project approach, seeks to facilitate the funding of an entire climate plan. In total, the project aims to raise 17 million in three key sectors: public and private buildings and small and medium-sized enterprises.

TEXT BOX 9

The Alliance also coordinates [three working groups](#) on monitoring CO<sub>2</sub> emissions and more recently on access to financing, launched in 2012, and adaptation, launched in 2015. It currently runs [eight campaigns](#) at the European level. These can take the shape of certification and awards for local authorities for awareness-raising activities amongst their citizens. In 2018, 880 municipalities participated in the [City Cycling](#) campaign encouraging residents to record the distances they had travelled by bicycle over a period of 21 days. The Association estimates this year that this campaign led to 7,413 tonnes of CO<sub>2</sub> being avoided.

Finally, its cooperation with organisations of the indigenous peoples of the Amazon basin has led to several visits by representatives from both sides of the Atlantic, the provision of financial support to the representatives of the indigenous peoples who are fighting to preserve their lands and resources, and to the communities themselves to help them inform the inhabitants of their territories about their rights and the impact of their countries' infrastructure projects. On the project side, the Alliance has supported projects backed by communities for the manufacture and distribution of solar lights of which 439 were distributed in 2014.

# Reporting Platforms

**MyCovenant, CDP-Cities and the carbonn® Climate Registry (cCR) are the 3 reporting platforms recognised by the Global Covenant of Mayors for Climate & Energy. The platform MyCovenant was created in the framework of the European Covenant of Mayors, and some analysis of the data reported in it are described above. The cCR and CDP-Cities platforms host data reported by several global initiatives and are described below.**

**To avoid that local governments, have to report multiple times on various platforms, and to improve the comparability of data reported, all the platforms serving the GCoM are going to be aligned (shared reporting requirements) and are following the GCoM reporting framework, while retaining the specific features of each platform. From 2019 CDP and ICLEI will join forces and promoting the CDP platform as the one entrance point for online local government information collection, aligning questionnaire, communication and capacity training procedures.**

**These platforms offer canvas for reporting GHG emissions, for the targets set by local authorities themselves<sup>11</sup>, and climate change mitigation actions, and more recently adaptation actions. They also promote the use of neutral Measurement, Reporting, Verification (MRV) systems for climate actions, to be able to support local governments in coordinating with other levels of governance, enhance transparent communication and ensure tracking results.**

**This section outlines the key figures between 2015 and 2018 from the reporting on the cCR and CDP-Cities platforms, to give some insight into developments in the commitment of local governments to climate data transparency, progress reporting, as well as the difficulties encountered. It gives eventually an insight of the different methodologies for GHG emissions calculation.**

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<sup>11</sup> Local authorities belonging to the Covenant of Mayors in European Union countries have, as their minimum target, the emissionsreduction objectives set by the EU as part of its 2020 and 2030 climate and energy frameworks.

## A. THE CARBONN® CLIMATE REGISTRY (CCR)

The carbonn® Climate Registry (cCR) is the largest reporting platform for GHG emissions, action plans, targets, climate resilience/adaptation actions. It was launched at the World Mayors Summit on Climate in Mexico on 21 November 2010 and is managed by the carbonn® Center and hosted by the ICLEI World Secretariat in Bonn, Germany. This platform allows more than 950 registered entities to exchange and compare their actions and results, and helps them produce their MRV mechanism, by offering them a framework, and facilitating vertical integration of the reporting between different levels of local and national governance. These data also serve to further ICLEI's advocacy work, as a focal point for local governments and municipal authorities (LGMA) in international negotiations.

The cCR serves as a reporting platform for several initiatives including the Global Covenant of Mayors, the Compact of States and Regions, and also for networks of a more thematic nature such as the Climate Clean Air Coalition, the Building Efficiency Accelerator, the District Energy in Cities initiative, EcoMobility, and the 100% Renewables Energy Campaign. **The figures provided below are an aggregation of the figures for cities belonging to one or more of these initiatives: For example, of the 1,059 local authorities currently reporting on the platform, 367 belong to the Global Covenant of Mayors.**

REPORTING YEAR	NUMBER OF ENTITIES REPORTING	COUNTRIES REPRESENTED	INHABITANTS REPRESENTED (IN MILLIONS)	MITIGATION/ ADAPTATION ACTIONS REPORTED	TOTAL GHG EMISSIONS REPORTED	CUMULATED POTENTIAL EMISSIONS REDUCTION BY 2020
2015	608	62	553	6,081	2.2 GtCO <sub>2</sub> eq/year	1 GCO <sub>2</sub> eq
2016	726	67	660	6,287		>1 GtCO <sub>2</sub> eq
2017	1,019	86	804	7,083		5.6 GtCO <sub>2</sub> eq
2018 (october)	1,059	89	836	7,114		>5.6 GtCO <sub>2</sub> eq

TABLE 3. EVOLUTION OF THE NUMBER OF ENTITIES REGISTERED WITH THE CCR AND THEIR DELIVERABLES 2015-2017

(Source : cCR annual reports)

These figures show that the number of local authorities reporting their GHG emissions and adaptation actions has doubled since the Paris Agreement was signed, going from more than 500 in 2015 to more than 1,000 in 2018. The rate of growth of the number of local authorities reporting their emissions and commitments seemed, however, to slow down in 2018.

The monitoring of the implementation of the commitments taken by local authorities, representing almost 1/8 of the planet, is essential for the implementation of the Paris Agreement. In its latest report "[Boosting Subnational Climate Action](#)", the cCR, nonetheless, considers that only **10% of the targets set by local authorities are likely to be met, given the evolution observed in GHG emissions.** It calls on national states to identify local authorities on their territories which need greater technical and financial assistance.

**The cCR online platform can be used to view the profiles of 715 local authorities which have reported at least one objective, inventory or action (Figure 16).** Few cities in North Africa, the Middle East and West Asia are represented, unlike East Asia which accounts for the most registered cities. In Japan, where the first cCR national branch was launched in 2012 to encourage cities to publish their commitments and their progress, more than 100 Japanese cities have reported at least one GHG inventory on the cCR platform.

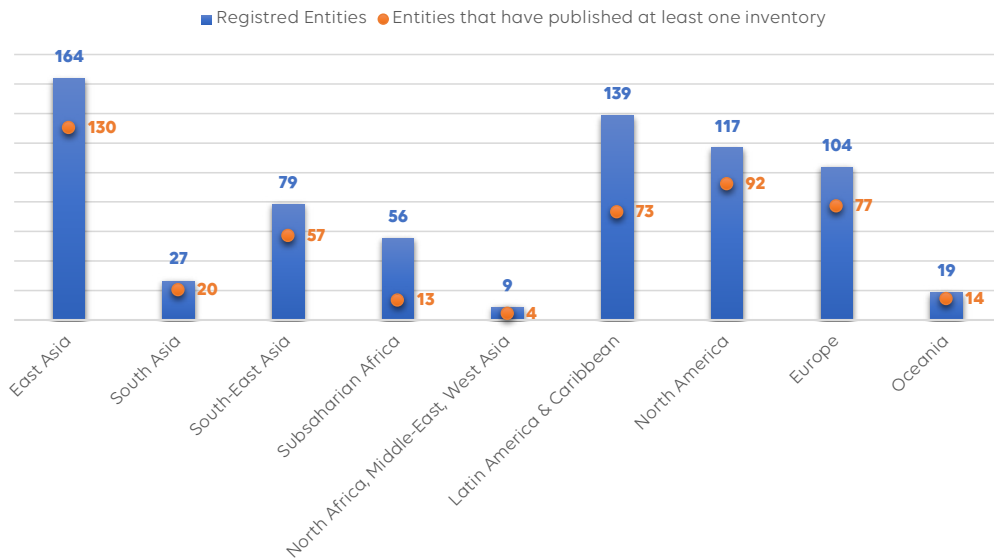


FIGURE 16. GEOGRAPHICAL DISTRIBUTION OF CITIES AND REGIONS PRESENT IN THE CCR

(Source : cCR online platform)

## B. CDP-CITIES

CDP is a platform created in 2000 for the reporting of GHG emissions data and environmental performance mainly designed for large companies. It now has more than 6 300 companies which, in 2017, responded to one of CDP's forms on climate change, water, forests and production chains.

With time, the platform has become an important actor in local authority reporting, with more than 500 cities in 100 regions and states in 2017. CDP, using this global data, regularly publishes research reports on the impact of industrial sectors, the climate action of local authorities and the progress they are making. Just like in the case of the cCR, these data, largely placed in the public domain by local authorities, serve to identify local sectors and policies where there is significant potential for action and emissions reduction, and also for research projects and advocacy.

CDP-Cities is the official reporting platform of the C40 network and the Under2 Coalition, and one of the three official platforms of the Global Covenant.



## Reporting by cities 2018

Since 2011, the C40 has collaborated with CDP in the reporting of the data of the cities in its network. The total number of cities reporting to CDP is, however, greater than the cities which only belong to the C40, and consequently, of the **229 cities in the 2017 database, only 56 belong to the C40 network, but represent 0.9 GtCO<sub>2</sub>eq, i.e. 65% of aggregated emissions.**

In 2017, all 229 cities reported their emissions under scopes 1 and 2, and 112 also included waste in scope 3. **Significantly, a stable proportion of cities, between 40 and 50%, have recorded, on an annual basis, progress in terms of reducing emissions compared with their previous inventory or baseline (see Table 4). These data should however be treated with caution as cities use different methodologies and do not cover all the same scopes or sectors.** Similarly, progress achieved by cities in calculating and managing the data may make tracking their progress from one year to the next relatively meaningless. Finally, in table 5 presented here, the column with the name of the city reporting each year does not show a linear development in members as some cities do not report their emissions from one year to the next.

YEAR	NUMBER OF CITIES HAVING REPORTED TO CDP		INCLUDING CITIES OF THE C40	CO <sub>2</sub> EQ REPRESENTED	POPULATION REPRESENTED (IN MILLIONS)
2015	119		44	1.25	
	46	31			
2016	187		54	1.29	260
	84	36			
2017	229		56	1.41	279
	101	45			



 Number of local authorities reporting a fall in GHG emissions compared with their previous inventory..  
 Number of local authorities reporting a rise in GHG emissions compared with their previous inventory..

TABLE 4. EVOLUTION IN THE NUMBER OF CITIES PRESENT ON THE CDP PLATFORM.

(Source : City Emissions-Wide 2017)

\*Figures based on public databases available from CDP

The remaining local authorities are those which are carrying out their GHG inventory for the first time, whose emissions have not changed, or which have changed methodology.

Cities reporting to CDP are mainly concentrated in North America with 43% in 2017, and in Europe with 28% (see Figure 17). Asia, where the use of the cCR Is more widespread, the number of Asian cities reporting to CDP is relatively low. However, with the announcement of a new partnership between ICLEI and CDP, and a unification of the reporting platforms, all public cities data will be available from the same source.

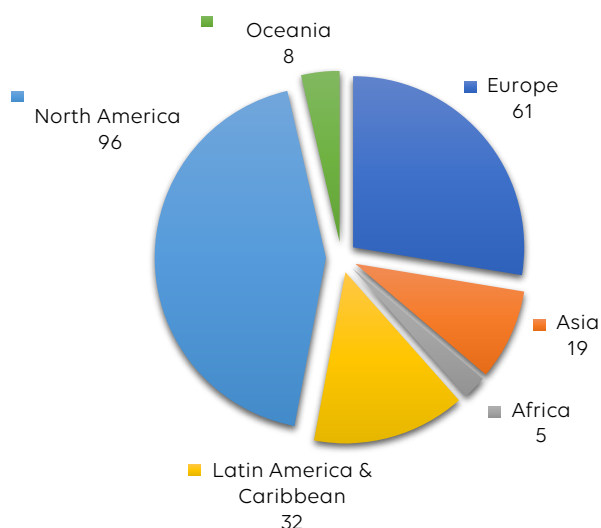


FIGURE 17. GEOGRAPHICAL DISTRIBUTION OF CITIES REPORTING TO CDP.

(Source: "City Emissions-Wide 2017")

Finally, as regards the methods used, CDP databases show that half of the 229 cities that reported their GHG emissions on these in 2017 now use the Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC), compared with only 23/119 in 2015 (see IV on methodologies for territorial inventories), showing that reporting is gradually becoming standardised. Thirty-one use the IPCC guidelines and 44 use methods specific to their territories or ones they have already used in a climate initiative such as the Covenant of Mayors (MEI, Bilan Carbone, etc.).

## C. NON-STATE ACTOR ZONE FOR CLIMATE ACTION (NAZCA)

NAZCA is a global platform which lists commitments by cities, regions, companies, investors and civil-society organisations, launched in 2014 during COP20 under the presidency of Peru. This platform is the main tool of the Lima-Paris Action Agenda (LPAA) and reports on action by non-state actors in the implementation of the Paris Agreement. This portal is a tracking and reporting tool designed to recognise existing actions and attract new commitments from nonstate actors – **cities, regions, companies and investors**.

In 2016, the Data-Driven Yale report, "Taking Stock of Global Climate Action", provided an inventory of the commitments reported on the NAZCA platform by actor type and emissions sector. These commitments by 2,578 cities involve 757 million inhabitants and those of 211 regions, 908 million inhabitants. They are mainly from European cities and regions (1,769 cities out of 2,578 and 95 regions out of 211), and also from East Asia and the Pacific (212 cities and 42 regions) and North America (211 cities and 30 regions) (Figure 18). The report highlighted the low representation of African cities and regions on the NAZCA platform (1 region and 7 cities). In quantitative terms, the report noted that there were 14,639 emissions-reduction targets listed in 2016, of which 56% had set 2020 as their deadline, 10%, 2030 and 34%, 2050.

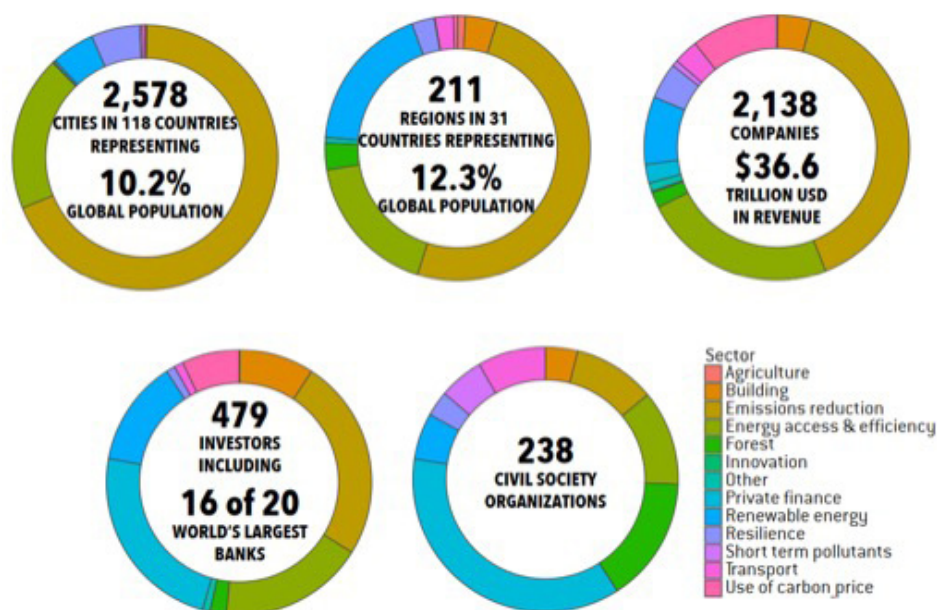


FIGURE 18. COMMITMENTS REPORTED TO THE NAZCA PLATFORM BY ACTOR TYPE AND SECTOR.

(Source : Figure taken from [Taking Stock of Global Climate Action](#), Data-Driven Yale)

A second, more comprehensive and user-friendly version of the NAZCA platform was put online in September 2018 offering non-state actors more control. It contains the contributors to the main platforms and initiatives described in this chapter: CDP, Carbon Climate Registry, Climate Initiative Bonds, the UN Environment’s Climate Initiatives Platform, Global Covenant of Mayors, Investors on Climate Change, The Climate Group, and UN Global Compact, etc. In total, 9,524 cities, 78 regions, 2 430 companies, 354 major investors and 17 NGOs have recorded their actions on the new platform.

The report [“Cooperative Climate Action: Global Performance & Delivery in the Global South”](#) published on 10 September 2018<sup>12</sup> analyses the 77 main NAZCA initiatives, with 18,907 instances of participation by these non-state actors. **The report, which records progress achieved, notes that there is still a wide gap between actors in the North and the South: only 22% of participants in the initiatives are from countries which are not members of the OECD (Figure 19).**

Nevertheless, while we do not have statistics on the amount of financing by the different regions, **the report notes that 30% of the organisations financing initiatives from non-State actors are from emerging countries and 80% of the initiatives reported to NAZCA involve countries from the South.** It should, however, be noted that, to date, the new NAZCA platform only records commitments by contributors and does not yet mention the outcomes of each of these initiatives in terms of emission reductions.

<sup>12</sup> published by the African Centre for Technology Studies (ACTS), the Blavatnik School of Government and Global Economic Governance Programme at the University of Oxford, the German Development Institute/Deutsches Institut für Entwicklungspolitik (DIE), TERI University.

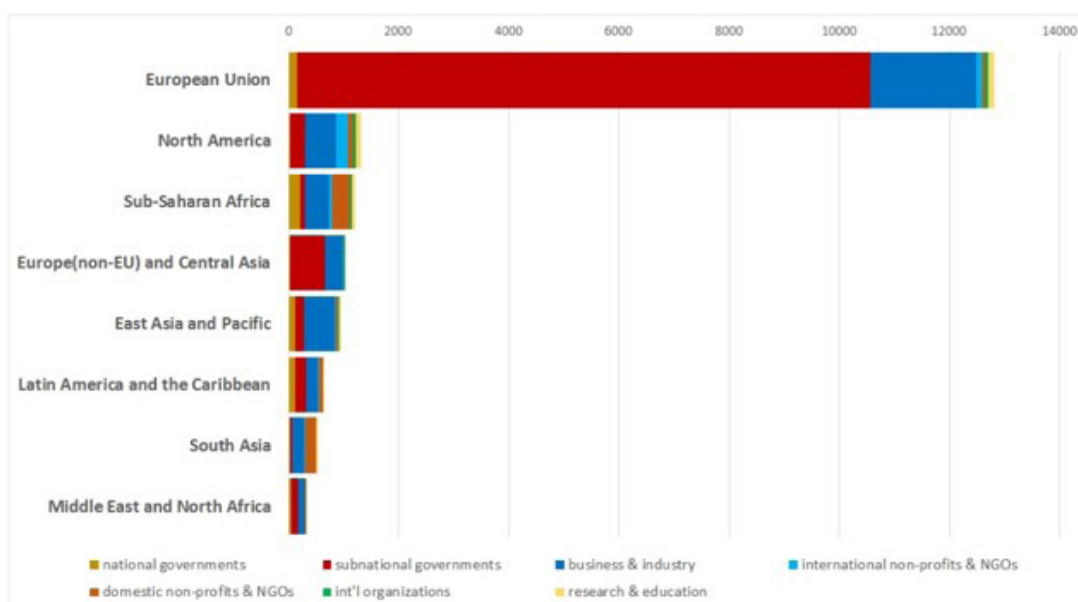


FIGURE 19 - NUMBER OF NON-STATE ACTORS REPORTING ON THE NAZCA PLATFORM BY ACTOR TYPE AND REGION.

(Source : Figure taken from [Coopérative Climate Action : Global Performance & Delivery in Global South](#), Global Economic Governance Programme)

## D. METHODOLOGY OF COMMUNITY-WIDE EMISSIONS INVENTORIES

Over the last 10 years or so, measurement, reporting and verification(MRV) of greenhouse gas emissions tools have been increasingly tailored to local needs with the creation of the purpose-built reporting platforms described above, and also with the creation of accounting methods tailored to the specific requirements of local cities and territories, which attempt to mitigate difficulties in accessing and processing secondary data. Consequently, this section seeks to review measurement principles for greenhouse gases and provide a non-exhaustive list of the main accounting methods that the territories can use.

The community-wide approach can be differentiated from the organisation approach which studies GHG emissions from the activities of the local authority itself (city heritage/jurisdiction). A greenhouse-gas inventory at territory level studies all flows that drive activity in a geographical or administrative territory and quantifies the greenhouse gases emitted by these flows.

### Scopes

A territory overview can include up to 23 types of emission divided into 3 categories:

- **Scope 1:** Direct GHG emissions produced by fixed platforms or mobile units on the administrative or geographical territory. These are territory emissions linked to individual and collective habitats, travel by inhabitants (work, school, leisure), waste treated on the territory, industry and agricultural activity.
- **Scope 2:** Indirect GHG emissions linked to the production of electricity and heating and cooling networks, generated on or outside the territory, but whose consumption takes place within it.
- **Scope 3:** All other indirect GHG emissions which take place outside the territory but which are generated by activities of actors in the territories concerned. They are caused, for example, by the

production and transport of consumer goods, (air) travel by residents outside the territory, waste treated outside the territory, etc.

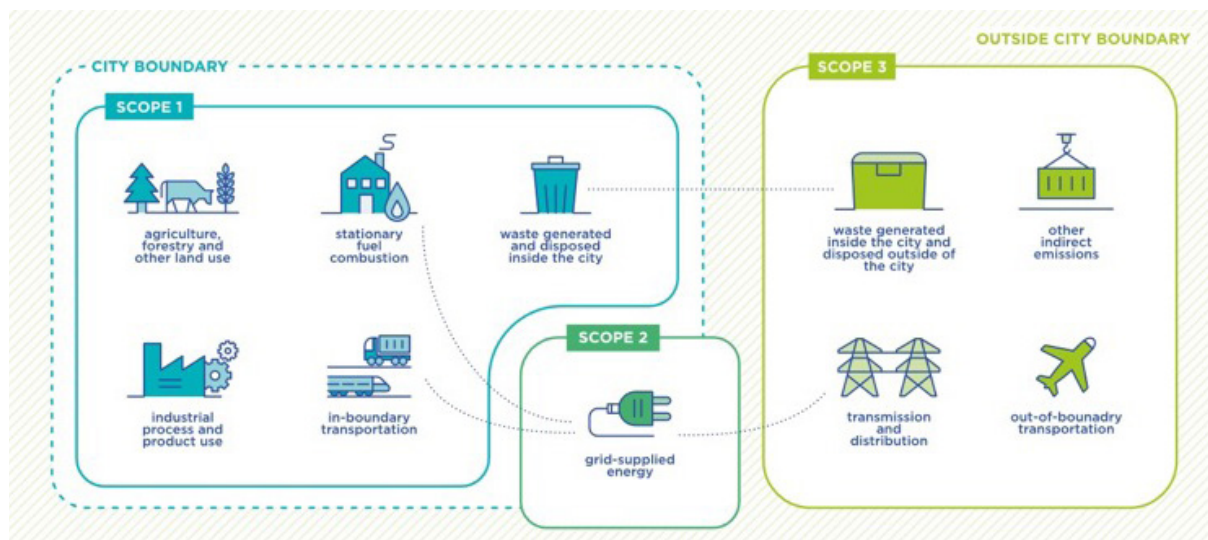


FIGURE 20. EMISSIONS SECTORS ACCOUNTED FOR WITHIN THE SCOPE.

(Source: "Consumption-based GHG Emissions of C40 Cities", C40, 2018).

### 3 main approaches for calculating GHG emissions of a territory

The emissions inventory generally uses the same principles as those for national inventories in line with UNFCCC requirements. The "inventory method" is relevant at the level of a national territory and is useful for minimising double counting between countries, but only "global methods" provide a complete overview of the activities of the local territory, by accounting for scope 2 emissions linked to the generation of electricity, steam or heat beyond its boundaries (which is frequently the case with cities), and more generally scope 3 emissions linked to the energy consumed to supply goods and services necessary to the territory's activities.

Global methods can establish diagnoses (inventories) followed by action plans, when the inventory method allows territory emissions to be aggregated, because scope 2 and 3 emissions are frequently scope 1 emissions from other territories and their aggregation could lead to double counting.

The consumption approach offers a method based on the consumption of goods and services by the actors of the territory, its inhabitants, companies and the community's own services. It can be used to identify more specifically other means of action that can be used to reduce its indirect emissions as shown in the recent study of consumption-based emissions of C40 cities "[Consumption-based GHG Emissions of C40 Cities](#)".

APPROACH	TERRITORIAL METHOD	GLOBAL METHOD	CONSUMPTION-BASED METHOD
<b>SCOPE</b>	This calculation of GHG emissions emitted directly on the territory by all actors by activity sector (Scope 1) does not take account of indirect emissions caused by meeting the needs of territories, other than indirect emissions linked to the consumption of energy originating in a production unit on its territory (Scope 2). Scopes 1 and 2	Emission accounting taking account of all GHG emissions, whether direct or indirect, in other words, whether they are emitted by or for the territory. This is a more complex method because it requires a form of data collection that might prove difficult given the dispersed nature of information and a lack of statistical data at community level. A large degree of uncertainty is involved in accounting for indirect emissions. Finally, the use of scope 3, whose accounting methods are specific to each tool, renders comparisons impossible. Scopes 1, 2 and 3 (scope 3 is covered on a variable basis)	Accounting for all goods and services required by the territory (from internal production and imports) and therefore all sectors required for the final consumption by the inhabitants of the territory (sectors present on the territory or otherwise). This approach essentially takes account of the issue of consumption-based emissions as this is an emission source. As emissions are related to the end consumer, actions will naturally focus more on citizens and consumption-based behaviours and production and service companies..
<b>ADVANTAGES</b>	<ul style="list-style-type: none"> <li>• More precise method</li> <li>• Reductions target based on this method</li> <li>• No double counting</li> </ul>	<ul style="list-style-type: none"> <li>• Comprehensive coverage of emissions</li> <li>• Raises all problems</li> </ul>	<ul style="list-style-type: none"> <li>• Easy to interpret</li> <li>• Communications oriented towards the citizen</li> </ul>
<b>DISADVANTAGES</b>	<ul style="list-style-type: none"> <li>• It has a degree of bias in measuring emission reductions (e.g. outsourcing, electricity, etc.)</li> <li>• Excludes international maritime and air transport</li> </ul>	<ul style="list-style-type: none"> <li>• Not standardised</li> <li>• Complex to interpret</li> <li>• Double counting</li> <li>• Integrated approach with other territories: enables identification of the degree to which the activity of a different territory can impact its emissions count and vice versa</li> </ul>	<ul style="list-style-type: none"> <li>• Difficult to calculate</li> <li>• Calculations cannot be standardised</li> </ul>
<b>USES</b>	<ul style="list-style-type: none"> <li>• International standard</li> <li>• Basis for all other methods</li> <li>• Permits aggregation to higher levels</li> </ul>	<ul style="list-style-type: none"> <li>• Design of a territorial action plan (PCET, PCTI etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Mobilisation of citizen and actors of the territories (industries, compagnies...)</li> </ul>
<b>EXISTING TOOLS</b>	<ul style="list-style-type: none"> <li>• National inventory similar to UNFCCC or equivalent</li> <li>• BASEMIS®</li> </ul>	<ul style="list-style-type: none"> <li>• Bilan Carbone® Territory</li> <li>• Global Protocol for Community-Scale Greenhouse Gas Emissions Inventories (GPC)</li> <li>• BEI/MEI</li> <li>• US Community Protocol</li> <li>• GESi Territory (under development).</li> </ul>	<ul style="list-style-type: none"> <li>• PAS 2070</li> </ul>

TABLE 5. CHARACTERISTICS OF THE 3 METHODS OF CALCULATING TERRITORY EMISSIONS

(Source : Association Bilan Carbone website)

## Existing methods for GHG accounting

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### • INTERNATIONAL ISO STANDARDS •

All existing methods must comply with ISO (International Organisation for Standardisation) standard 14064 on climate change, and, more specifically, ISO 14064-1:2006 which specifies principles and requirements for the design, development, management, and reporting and the verification of the GHG inventory, which must comply with the following key principles: relevance, completeness, consistency, accuracy and transparency. This revised norm has been available since 2018 on the [site de l'ISO](#).

ISO 14069 provides guidance for the application of ISO 14064-1 and additional information regarding the definition of different types of emission, giving specific examples. It describes the steps to be taken for establishing organisational and operational boundaries and provides guidance to promote transparency regarding the boundaries, the methodologies used for the quantification of direct and indirect GHG emissions and removals, and the uncertainty of the results.

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### *ISO norms also regulates adaptation measures*

ISO norms do not only cover greenhouse-gas accounting and reporting and mitigation actions, they also cover adaptation and financing climate change activities. Indeed, in addition to the six ISO standards regulating mitigation, three standards deal with the requirements for adaptation measures (14090), the assessment of vulnerability, risks and impacts (14091), and, finally, adaptation planning by states and local governments (14092). Standard 14097 provides the framework and principles for assessing and reporting investments and financing activities related to climate change.

TEXT BOX 10

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### • METHODS DERIVED FROM IPCC GUIDELINES •

The vast majority of territories apply the regulatory methods produced by national local authorities, or methods derived from IPCC guidelines. These methods, applied locally, generally classify the activities of the territory as follows ([ICLEI 2014](#)):

**Stationary energy:** assesses emissions from energy consumption in buildings from networks (electricity, heating, cooling) and not from energy generation.

**Difficulties:** location of production units is often outside the territory.

**Mobile energy:** assesses emissions from transport in the territory in question. This is calculated on the basis of fuel sales and statistics relating to the city's modal share.

**Difficulties:** distinguishing in-boundary movements from cross-boundary movements and accounting for air transport used in transporting actors from the territories.



**Waste:** Emissions related to the treatment of waste from the territories, treated either within the territory (Scope 1), or outside its geographical boundaries (Scope 3).

**Difficulties:** (1) Need for a significant flow of secondary data making quantification difficult; (2) whether to attribute waste from a territory to one shared treatment unit, or to another territory.

#### **Industrial Processes and Product Use (IPPU)**

**Difficulties:** how to estimate products produced by factories on the territory which are intended for export.

ICLEI has noted, in addition to difficulties in calculating each of these emissions sectors, several limitations at the local level:

- Overestimates and double counting of emissions, or, on the contrary, underestimates of sectors over which local government has little control (agricultural activities, infrastructure belonging to a higher administrative level).
- Access to data limited by poor disaggregation of national data for geography, lack of access to the data of economic actors on the territory, or simply insufficient financial and human resources for their collection.
- Any emissions related to the consumption of imported goods are direct emissions for other local governments, and this makes comparisons impossible.
- A lack of consistency and numerous inaccuracies have led several organisations to put forward global methods designed specifically for territories.

#### **• GLOBAL PROTOCOL FOR COMMUNITY-SCALE GREENHOUSE GAS EMISSIONS INVENTORIES (GPC) (BY ICLEI, C40 AND WRI) •**

Launched in 2014 by the World Resources Institute (WRI), ICLEI and the C40 to offer guidelines to a range of very different local authorities for calculating their own emissions. This is a global method adapted from the GHG Protocol created by the WRI and the World Business Council for Sustainable Development (WBCSD) in 1998 for businesses, replacing the International Local Government GHG Emissions Analysis Protocol (IEAP) developed by ICLEI, and the International Standard for Determining GHG Emissions for Cities of the UNEP, UN-Habitat and the World Bank.

**Methodology and tool:** It was designed to facilitate the planning of local government climate policies including tracking performance and selected goals, and to compare and aggregate inventories at regional or national levels and better gauge the importance of regions and cities. Consequently, the guide comprises three parts:

- Setting out how to define the inventory's geographical boundaries, specifies reporting requirements and offers a sample reporting template;
- Providing overarching and sector-specific accounting and reporting guidance for sourcing data and calculating emissions, including calculation methods and equations;
- Showing how inventories can be used to set mitigation goals and track performance over time.

The GPC also uses the scopes described above and consequently includes in-boundary and out-of-boundary emissions. Nevertheless, it adopts its own two reporting levels, which map differently onto the scopes:

- **BASIC:** includes emissions sectors common to almost all territories:  
**(1)** stationary energy: scope 1 minus the production of in-boundary energy injected into the network



+ scope 2

(2) transportation to the territory: scopes 1 + 2

(3) waste generated on the territory: scope 1 minus emissions from imported waste + scope 3 emissions from treatment of exported waste.

• **BASIC +:**

BASIC level sectors

(4) industrial processes and product use: scope 1

(5) agriculture and land use: scope 1

(6) cross-boundary transportation: scope 3

(7) stationary energy: scope 3 linked to losses during transmission and distribution. transmission.

**Further information:** [CLEI Presentation of GPC](#) et [GHG Protocole website](#)

• **BILAN CARBONE® TERRITORY** •

Bilan Carbone® is a global method created by the Agency for the Environment and Energy Management (ADEME) in 2004 and backed by the Association Bilan Carbone (ABC) since 2011. Version 8 of Bilan Carbone® launched in 2017 was developed to align with post-COP21 best practices, and offers different tools suitable for organisations and territories. It can be used to carry out particularly exhaustive emissions accounting with, as its main objective, emissions reduction.

**Methodology and tools:** The use and methodology of the Bilan Carbone methodology and tools is supported by training delivered by the [l'Institut de Formation Carbone](#) (IFC) (Carbon Training Institute) or by an expert trained in its use.

Bilan Carbone® version 8 offers a 5-step approach:

- Designating a project manager and determining the objectives of the Bilan Carbone® project
- Setting its (organisational, operational, temporal) boundaries
- Collecting and exploiting activity data
- Emissions reduction plan
- Summary and final report

For this purpose, it offers outlines for activity data collection and a dashboard for drawing up an emissions-reduction action plan. These tools can be exported in other formats such as those used by GPC or CDP to meet different existing standards. The method suggests that the approach should be renewed each year with close monitoring of the action plan.

In France, these inventories are part of the wider planning approach of the Regional Climate, Air and Energy Plans (PCAET) which are compulsory for intercommunal authorities of more than 20,000 inhabitants, which provide these residents with a genuine commitment framework. This planning tool has also been exported to other regions of the world. **This method has been adapted as part of a Life Clim-Foot, program, at the scale of 5 European countries.**

**Further information:** [Association Bilan Carbone website](#) & [Site du Bilan GES](#)

## • OTHER METHODS •

**Baseline Emissions Inventory (BEI) / Monitoring Emissions Inventory (MEI):** Denominations used by the global method of calculating emissions included in the Covenant of Mayors MRV mechanisms and the MyCovenant platform. These inventories are validated by the European Joint Research Centre and are available in 11 languages. These inventories cover CO<sub>2</sub> emissions, and optionally methane (CH<sub>4</sub>) and nitrous oxide (NH<sub>2</sub>) emissions, related to the final energy consumption of municipal, tertiary and residential buildings and transportation. Other sectors such as industry may be included in the inventory if they are subject to actions under the Sustainable Energy and Climate Action Plan (SECAP). Similarly, emissions related to local energy generation are counted as indirect emissions, encouraging local governments to reduce the emissions of production units via local renewable energies, etc. Finally, this method allows local governments either to use standard IPCC emissions factors, or to use life-cycle emission factors (accounting for upstream and downstream emissions).

**Further information:** [Joint Research Centre website](#)

**US Community Protocol:** Global method devised by ICLEI US Office for use by local governments in the United States. It is also a global method designed for measuring emissions, formulating emissions-reduction goals and producing an action plan. This method does not adopt the scopes framework described above as it is not suitable for calculating a territory's emissions. Instead, this protocol requires the reporting of emissions for a minimum of five activities: (1) use of electricity by the community; (2) use of fuel in buildings (gas etc.); (3) use of fuel in passenger and freight transportation; (4) use of energy in drinking water stations and wastewater treatment and distribution; (5) generation of solid waste by the community.

**Further information:** [Air Pays de la Loire website](#)

**BASEMIS®:** Territorial method developed by the cities of Nantes and Strasbourg, in collaboration with air-quality monitoring agencies (agences de suivi de la qualité de l'air - ASQA) in France. It has the advantage of offering an integrated air-climate and energy approach, with a detailed inventory of atmospheric pollutants. It is a territorial or "land registry" accounting method as it counts emissions in the place in which they are emitted, on a defined territory. It inventories all sectors emitting stationary (industrial and agricultural establishments, residential and tertiary sectors) and mobile (road, air, rail transportation, etc.) emissions using the following formula: the quantity of pollutants discharged into the atmosphere over a time period, T, multiplied by a particular quantity of activity (tonnes produced, kms travelled, kWh hours consumed, number of persons, etc.). For energy-based emissions, activity quantity is energy consumption.

**Further information:** [Pays de la Loire regional website](#)

**PAS 2070:** Double method developed by the British Standard Institute in collaboration with universities, research centres and local government networks (ICLEI, C40), which can also take account of activities outside the territory, enable emission comparisons between territories and identify means to reduce them within the urban value chain. PAS 2070 offers both a global "Direct plus supply chain" (DPSC) method based on the Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC), and a consumption-based method which calculates direct emissions and those related to the life cycles of goods and services consumed by a city's actors (but not those intended for export).

**Further information:** [British Standard Institute website](#)



## SECTION II



# Territorial results



**23 CASE STUDIES ANALYZING THE  
PROGRESS MADE BY CITIES AND REGIONS  
AROUND THE WORLD THROUGH THE  
ALIGNMENT OF PUBLIC POLICIES**









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- URBAN PLANNING 
- ENERGY 
- LAND USES 
- BUILDING 
- FOREST 
- TRANSITION OF THE ECONOMY 
- TRANSPORT 
- FOOD 
- ADAPTATION 

# 15 CITIES ACROSS THE WORLD





## Towards carbon neutrality by 2050

GHG emissions in the city of Accra were about 2.57 MtCO<sub>2</sub> in 2015, less than one tonne per capita, well below the global average (C40). These emissions are due to waste (38.5%), transport (37%) and stationary energy (24%). The Metropolitan Assembly of Accra (AMA) has been committed to a climate-compatible development approach for several years and has, as such, joined several networks of cities - the C40 since 2009 and, more recently, the Covenant of Mayors in Sub-Saharan Africa.

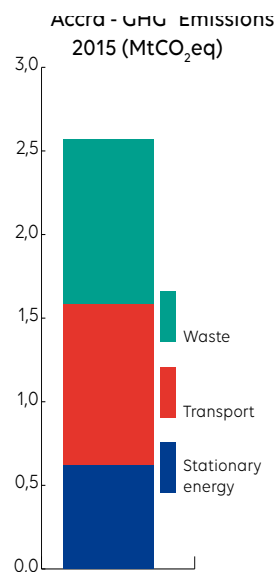
### • WEST AFRICA'S PIONEERING CITY IN MITIGATION •

Accra displays a strong desire to make the city an example for all of West Africa:

• **Accra has been disclosing its climate data to the CDP since 2016, demonstrating its capacity to collect and aggregate data, a major obstacle in many African territories. To achieve this, municipal teams have been supported by capacity reinforcements through MRV (Measurement, Reporting Verification) mechanisms, in particular through the production of emissions inventories;**

- During the COP23, Accra made a commitment to putting in place an ambitious climate action plan by 2020 and to achieve carbon neutrality by 2050;
- In August 2018, the city was the first metropolis in Africa to join Breathe Life, the global campaign for the reduction of air pollution [Breathe Life](#), the global campaign for the reduction of air pollution.

As part of this campaign, several sectoral initiatives have been launched in the areas of energy efficiency, renewable energies, the management of illegal landfills, etc.



### • A COMMITMENT TO CARBON NEUTRALITY TO BE ACHIEVED •

The carbon neutrality commitment is not currently included in the action plan, but, since May 2018, the city has been supported by the C40 [Climate Action Planning Africa Programme](#) (funded by the International Climate Initiative - IKI).

This programme supports nine African cities in the development of climate plans aligned with the Paris Agreement and will include, in the next three years, the organisation of workshops and the allocation of a dedicated local advisor.

A first workshop, [in September 2018](#), brought together several AMA departments, national representatives (including the Environmental Protection Agency) and civil society to address the definition of future scenarios for the development of the city. The workshop provided an opportunity to recall that combating climate change will also improve the living environment of the population and that close collaboration with the national level was necessary. This is especially so given that with a population of almost 2 million (2015) and 4 million in the Greater Metropolitan Area, the Accra region concentrates a large proportion of the Ghanaian population and economy.

### • ADAPTATION STRATEGIES TO BE ENHANCED •

Accra regularly suffers from floods that sometimes have disastrous human consequences with the development of epidemics. Lack of protection and care facilities and high population density make climate change a major challenge. Yet, to date, the city has not developed a specific adaptation strategy, adhering instead to the National Adaptation Strategy (NCCAS).

**Accra has been a member of the 100 Resilient Cities network since 2014 and in March 2018 published its [resilience diagnosis](#)**, which goes beyond climate alone with preparation for development of its resilience strategy on this basis. It establishes that the major sources of stress for the population are the cost of living, the inefficiency of public transport and waste management, and that the major shocks to which the city is subject are, in first place, floods, followed by fires and epidemics.



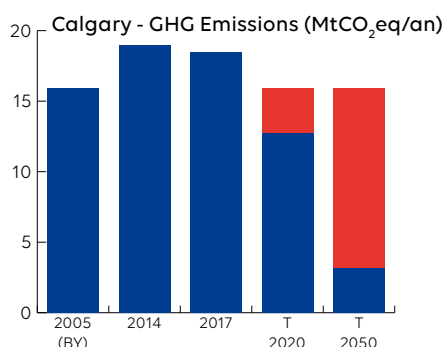


## An integrated, multi-level climate plan

Despite a decrease between 2014 and 2016, the city of Calgary's emissions are 16.5% higher than in 2005, with 18.5 MtCO<sub>2</sub>eq/ year in 2017. However, Calgary's 2018-2022 strategy, which includes 23 programmes and nearly 250 mitigation and adaptation actions, will lead the city towards a 20% reduction in emissions by 2020. It is also linked to the [Climate Leadership Plan 2015](#) of the Alberta province, and to the [City Charter](#), a legislative framework negotiated between the cities of Calgary and Edmonton and the Government of Alberta, which requires the formulation of a climate plan, but also gives them greater flexibility of action.

### • ELECTRICITY GENERATION, A MAJOR SOURCE OF EMISSIONS

Electricity accounts for 42% of Calgary's emissions, far ahead of natural gas (24%), gas oil (20%) and diesel (13%). This is because 47% of Alberta's electricity is generated from coal, 40% from natural gas, and only 13% from renewable sources. However, the province's plan includes shutting down coal plants by 2030, which is expected to contribute significantly to Calgary's mitigation efforts. The latter has also been able to take advantage of the climate benefits of its region, by fully supplying its own buildings with renewable energy. Wind energy has the lowest regional tariff in Canada at 3.7 cents/kWh in 2018, and with regard to solar energy, Calgary is the second-sunniest city in the country (CED 2018). Given Calgary's energy mix, the energy efficiency of buildings - accounting for 65% of emissions - is thus a double lever for its mitigation strategy: surface areas of +500 m<sup>2</sup> must meet the requirements of the national energy system of LEED ratification of the Canadian Green Building Council. For the rest, the city has formulated its own [good practices](#).



### • A MODAL SHIFT THAT IS RUNNING OUT OF STEAM

Calgary was the first city on the sub-continent to introduce a Light Rail Transit (LRT), which operates entirely on wind energy, saving 56,000 tonnes of CO<sub>2</sub> a year, according to the public company Calgary Transit. The city also holds the record in Canada as the city with the most rapid transit infrastructure available per capita with 53 km/ million inhabitants ([Pembinga 2014](#)) and one of the lowest congestion times in Canada behind Edmonton ([Tom Tom index](#)). However, an annual census of modes of transport used to access the business district in the morning during rush hour shows that their distribution has remained relatively stable for 10 years, with just under 50% of inhabitants using the metro and public buses, 40-45% using cars, and the rest cycling or walking ([Calgary 2018](#)). **The number of annual trips by metro and bus has also declined, from 109 million in 2015 the company reported 102 million in 2017 ([CalgaryHerald](#)).** It is seeking to reverse this downward trend in the modal shift by opening a third metro line in 2026, priority lanes for buses and the development of the city adapted to existing lines ("transit-oriented development").

Calgary's 2018 road transport energy emissions strategy aims to reduce its emissions, including the development of electric vehicles and the creation of a network of charging terminals in the south of the province, in addition to the 70 terminals currently in place in the city. Finally, Calgary Transit is determined to modernise its bus network, encouraged in particular by the carbon tax put in place by the province of Alberta, reaching CAD 30/ tonne in 2018, which could cost more than CAD 2 million ([RouteAhead Update](#)).

MAIN SOURCE:  
[CALGARY CLIMATE RESILIENCE PLAN 2018](#)



SOUTH AFRICA  
CAPE TOWN

POPULATION  
4,005,793 (2016)  
SCOPE  
1, 2 AND 3 (SOURCES C40)

GHG TARGETS  
-13% IN 2020 ;  
-37% IN 2040 (BASELINE:  
BUSINESS AS USUAL  
TRAJECTORY)



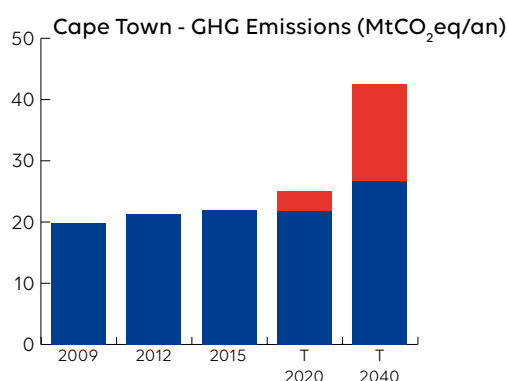
## Making power generation local



Cape Town City Council adopted its new climate strategy in July 2017, *Climate Change Policy*, one of the foundations of the overall environmental policy framework "[The Environmental Strategy of the City of Cape Town](#)" adopted in 2017. This plan does not replace the 2015 emissions reduction targets adopted by the council, that seek a 13% reduction by 2020 and a 37% reduction by 2040 if current trends continue. The city is focusing primarily on reducing the carbon and energy intensity of its activities, despite its intention - announced at COP23 - to achieve carbon neutrality by 2050 ([C40 2017](#)).

• **AN ENERGY POLICY FOCUSED ON ENERGY EFFICIENCY**

• In 2015, buildings consumed 31% of energy but accounted for 62% of GHG emissions, due to the carbon intensity of electricity, more than 90% of which was produced by coal. **The Western Cape province and the city of Cape Town are working together to implement the [Energy Security Game Changer](#) programme that aims to achieve a 10% reduction in demand of electricity from the national grid by 2020.** It is therefore stimulating the installation of solar water heaters by accrediting the services of private suppliers (+46,000 installed in 2017), and by subsidising the renovation of the roofs of the poorest households. The purchase tariff system introduced in 2014 led to 170 solar energy projects being approved in 2016, i.e. 6.5 MW of the 120 MW targeted by 2020 ([Cape Town 2017](#)). Finally, inspired by the Stockholm recovery system, in 2017 Cape Town opened the first biogas plant in Africa to process 10% of its waste and thus supply its buses with energy, like the Swedish capital ([New Horizons Energy](#)).



In 2011, Cape Town, in partnership with the province, opened a green technology manufacturing and training centre, "Atlantis", which claims to be a special economic zone with the national government, and

in which five companies from the construction and renewables sectors have already invested 680 million rand (EUR 40 million) and will create 312 jobs ([Green Cape 2017](#)).

• **THE MAJOR POTENTIAL OF THE MODAL SHIFT**

Representing 37% of the emissions but 68% of the energy consumption in 2015, Cape Town's transport has the highest pollution and traffic rates in the country, due to its poorly integrated network between different modes and operators. The city is therefore seeking to shift some of the 60% of residents using cars or taxis on its transport network. It is currently expanding its network of "[MyCiti](#)", bus lanes in the south, with total development to be staggered until 2032. This phase 2 is expected to benefit 1.4 million inhabitants by 2022. In 2018, a Cape Town pilot project also introduced the first 11 electric buses in the country, not without difficulties due to the geography of the city. MyCiti recorded nearly 78,000 additional trips in 2017 reaching 253,000, an increase of 44% ([IOL 2018](#)). In the long term the city also intends to promote the densification of urban areas along train and bus lines, with the use of bicycles on the 450 km of still under-used tracks and to further influence demand through car sharing within companies, for example.

• **THE URGENCY OF ADAPTATION**

• Cape Town is particularly vulnerable to droughts, heat waves and floods. In 2018, major restrictions led to its water consumption being halved, faced with the risk of becoming the first major city to cope with a general water shortage. In addition to its water management programme, the city is seeking to identify areas at risk (shanty towns, coastlines) and to improve its warning system.

MAIN SOURCE:  
[CAPE TOWN CLIMATE CHANGE POLICY 2017](#)  
[DATABASE FOR THE WESTERN CAPE](#)



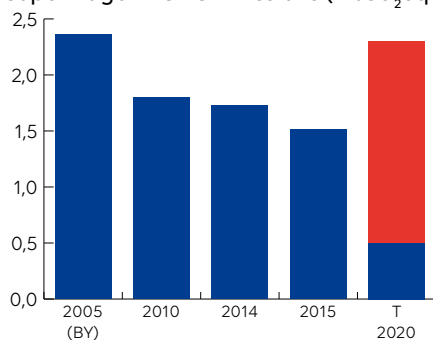
## To become the first carbon neutral city

The astonishing reduction of around 38% in GHG emission between 2005 and 2015 is mainly due to the development of biomass in cogeneration systems and the integration of wind power in the energy mix. In 2012, the city council adopted its climate plan, the [CPH Climate Plan 2025](#). With the aim of making Copenhagen the first carbon neutral capital, this is one of the most ambitious climate plans. It is structured in three phases (2013-2016, 2017-2020, 2020-2025) and leads to an evaluation and a redefinition of the priorities for the following period at the end of each phase. The reduction effort by 2025 is shared between four main action areas: energy consumption (7%), energy production (80%), mobility (8%) and city administration (5%). For each category, [more specific targets and approaches are defined](#). The idea of the latter is to put the administration at the head of the list of favourable initiatives.

### • IMPROVING THE DISTRICT HEATING SYSTEM AND TRANSFORMING THE CITY'S ENERGY MIX •

Copenhagen's combined heat and power system was launched in the mid-1920s and later developed in the 1980s. Today, it supplies 98% of the city's homes with the heat generated by energy production and waste incineration, but it remains the main source of Copenhagen's emissions. Given its dependence on fossil fuel prices (coal, oil and more recently natural gas) and air pollution problems, the city is developing the use of renewable energies for co-generation of electricity and district heating. The completion of phase 1 of its 2013-2016 Climate Plan enabled the conversion of co-generation plants, especially the combined **Avedøreværket, power plant, south of the city, which converted to 50% biomass by the end of 2016. Half of Greater Copenhagen's district heating system is now based on carbon-neutral fuels and will be entirely carbon-neutral by 2020.** The transition from coal to biomass is expected to contribute to more than 40% of the reduction target for emissions from energy production and heating by 2025, which is 750,000 tCO<sub>2</sub>.

Copenhagen - GHG Emissions (MtCO<sub>2</sub>eq/an)



### • CYCLING AT THE HEART OF COPENHAGEN MOBILITY STRATEGY •

Transport is Copenhagen's second source of emissions, 68% of which comes from cars and 25% from lorries and vans. In order to reduce them permanently, the city council has decided to reinforce its policy of promoting soft and green mobility. Since 2010, emissions from transport have decreased by 9% with a 12% increase in bike use in the modal share. In 2018, 41% of journeys that cannot be shortened - work and study - in Copenhagen are made by bicycle, with a target of 50% in 2025. In November 2016 there were more bicycles than cars in use in the Danish capital, 265 700 compared to 252 600. This modal shift towards cycling is the result of the "[Cycle lanes](#)" plan launched in 2012, which led to the construction of 350 km of elevated cycle lanes. Five new cycle lanes were inaugurated in 2017. Plans for the construction of the new cycle lanes, which now represent 7% of the capital's entire road network, were designed to make it possible to reach the city centre from the outlying areas, where the main trips are made by car. In the second phase of its 2017-2020 Climate Plan, Copenhagen intends to become the "[best city in the world for cyclists](#)" by continuing to expand its network, building new parking areas and facilitating a little more integration with its system public transport.

MAIN SOURCE:  
[CPH CLIMATE PLAN 2025](#)



## A first step taken to mobilize civil society



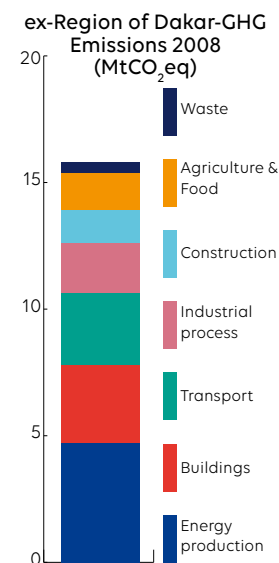
Beyond the mitigation issues, the City of Dakar faces the already proven impacts of climate change, in particular due to the disruption of rainfall patterns which, combined with development problems (rainwater drainage, informal housing), regularly leads to catastrophic floods. Dakar is also the second most polluted capital in Africa with a fine particle rate seven times higher than the authorised average (WHO 2018). It is in this context that the City of Dakar is currently working on the implementation of its Territorial Climate Energy Plan (PCET) as part of the pilot project of the Covenant of Mayors in Sub-Saharan Africa. The initiative, launched in 2017, is being funded by the European Union with up to 455 million CFA francs (EUR 700,000) over three years.

### • A STAKEHOLDER CONSULTATION MODEL, DRAWING LESSONS FROM PAST EXPERIENCES •

The new PCET, bringing civil society together around its implementation, is based on a first initiative, when in the 2012-2014 period, the former Dakar region, in partnership with the Ile-de-France region, produced its Integrated Territorial Climate Plan (ITCP). As early as 2011, meetings between actors were organised to spread a “climate culture” and facilitate ownership of the ITCP. This plan led to the co-construction of an energy-climate diagnosis, a vulnerability study, and nearly 50 action sheets (Dakar, 2013). The removal of the regional level, with Act III of the decentralisation had then undermined the mechanisms, but “the question of the legacy of the case by the four departments of the region of Dakar or by one of them, arises” (Faye et al. 2013).

The PCET still pursues the objective of improving the local governance of the ecological transition on the perimeter of the city of Dakar through an approach that still focuses on the mobilisation of local stakeholders. PCET’s “strong link”, the DakClim platform, launched in September 2018, brings together some fifty community organisations, women’s groups and farmers, NGOs, universities, and companies, for joint and participatory actions and to disseminate the achievements of the PCET at regional, national and sub-regional levels.

### • A STRUCTURED IMPLEMENTATION •



The carbon footprint of the former Dakar region in 2013 was 15.8 Mt CO<sub>2</sub>eq emitted in 2008 (PCTI 2013), a third of which comes from the energy production of the African Refining Company (SAR) refinery, the Senelec power plants and self-producers. Then comes transport (17%) particularly inflated by air traffic, then residential emissions (firewood, air conditioning), cement etc. This evaluation, in addition to taking

account of the economic activities of the region, also accounts for consumption-related emissions such as imported rice. It is therefore a true “scope 3” approach. The update of the vulnerability study and the city-wide carbon footprint will identify the levers for reducing emissions specific to Dakar and also enable the creation of funding instruments for the implementation of the PCET (project database and project files) as well as a training plan for elected officials and municipal technical services. The aim of this plan will be to boost public and private investment in resilient, low-carbon infrastructures with targeting a 30% reduction in the City’s energy bill and the creation of 300 green jobs thanks to energy efficiency measures.

MAIN SOURCE:  
DAKAR INTEGRATED TERRITORIAL CLIMATE PLAN - ASSESSMENT (2016)

GERMANY

FREIBURG IM BRISGAU

Un plan d'action à renouveler ?

POPULATION  
229,636 (2017)  
SCOPE  
1 AND 2

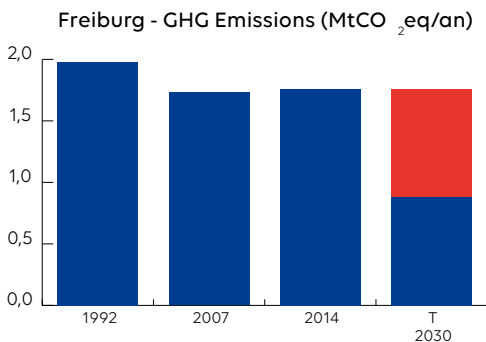
GHG TARGET  
-50% IN 2030;  
NEUTRAL IN 2050



The city of Freiburg adopted its first "Klimaschutzkonzept" (climate action policy) in 1996 with a GHG reduction target of 25% in 2010 compared to 1992. Its implementation, mainly focusing on the building and transport sectors, has only enabled an 11.1% reduction of overall emissions but a 30% reduction per capita. There has been a relative stagnation since 2007 with 1.76MtCO<sub>2</sub>eq emitted in 2014. That same year however, the city council of Freiburg voted the targets of -50% emissions by 2030 compared to 2014 and carbon neutrality by 2050. To reinforce efforts at all levels, a new [Klimaschutzkonzepts 2018](#) is under preparation, based on a consultation and citizen participation process for a one year period.

• SUPPORTING ON-SITE ENERGY PRODUCTION •

In 2014, 58.9% of GHG emissions were concentrated in the housing and services sectors, and 19.3% in industry. To become carbon neutral, Freiburg must reduce its energy consumption by half by 2050 and meet 95% of the remaining demand thanks to renewable energy. The most emblematic project is the transformation of the city hall completed in 2017 into an energy-plus house thanks to the combination of several technologies ([EnergieWendeBauen 2018](#)). The municipality is seeking to strongly develop the cogeneration of electricity and heat; an important tool for reducing GHG emissions in the city due to the proximity between production sites and consumption sites. The Klimaschutzkonzept provides for the installation of 3 to 4 units per year, making it possible to save 68,000tCO<sub>2</sub>eq each year compared to conventional heat supply ([Gov freiburg 2017](#)). Eight schools and a cultural centre are already supplied by these units.



Solar energy remains the main source favoured by Freiburg, which assesses its photovoltaic installation and production capacity at 860GWh, i.e. almost half of the canton's end-use electricity consumption. In 2015,

4% of the electricity consumed in Freiburg came from photovoltaic panels (PV). In May 2017, the city launched the campaign "your roof can do more", which aims at better informing the population and at promoting the installation of PV systems, and which enabled a saving of approximately 280tCO<sub>2</sub>eq. That same year, renewable energies made it possible to avoid a total of 38,000tCO<sub>2</sub>eq.

• RAISING PUBLIC AWARENESS ABOUT ENERGY SOBRIETY AND SUSTAINABLE MOBILITY •

Households account for more than a quarter of the end-use energy consumption in Freiburg. In order to better exploit its potential for electricity savings, the city offers free advice. The 500 households advised represent potential energy savings of about 238tCO<sub>2</sub>eq per year. The "Eco-energy Renovations" programme furthermore encourages owners to carry out refurbishment works to improve their energy efficiency (amount of the contribution: €550,000 in 2018). Thus, more than 10% of the buildings in Freiburg were subsidised for the whole duration of the programme.

The share of transport in GHG emissions is low (22% in 2014) but has remained at a constant level in recent years. Yet, car journeys accounted for only 21% of travels in 2016, and several recent projects should reduce this figure: underground extension in 2013 and 2015, 420 km of bicycle lanes in 2017 ([EcoMobility Freiburg](#)).

At the end of 2018, following the success of the first flywheel power storage system of 2014, a second one will be integrated into the tramway network, which will make it possible to return the energy stored through its rotation in other needs ([Reporterre 2018](#)).

MAIN SOURCES:  
[FREIBURG IM BRISGAU \(EN\)](#)  
[MONITORING REPORT 2017 \(DE\)](#)



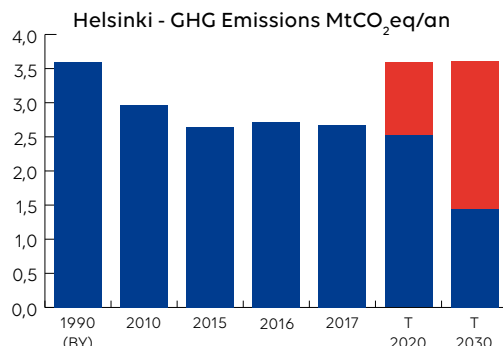
## Major progress undermined by heating needs



With a reduction of 24% in overall emissions and 42% in per capita emissions in 2017 (baseline 1990), Helsinki is on track to reach its 2020 target and reduce overall emissions by 30%. In September 2017, the city council therefore approved its objectives for the next four years outlining them in the city's overall strategy, the [Helsinki City Strategy 2017-2021](#), "The most functional city in the world". This programme is based in particular on the pro-active approach of the municipal energy company ([Helsinki Energia](#)), which has prepared an ambitious programme on the role of renewable energies, which has been adopted by the city council.

### • THE CHALLENGE OF SUSTAINABLE DISTRICT HEATING AND INSULATION •

To achieve its goals the city must focus on district heating, which accounts for 50% of emissions and was up 12% in 2016 due to the use of coal to meet rising demand. The increase was limited to 1% in 2017, offset by emissions from electricity consumption (-5%) and electric heating (-6%), resulting in an overall reduction of 2% in 2017, i.e. 2.67 MtCO<sub>2</sub>eq. Renewable energies still account for less than 15% of energy production dedicated to district heating. But the city is currently exploring its geothermal potential with the drilling of more than 3,000 wells, and is continuing the expansion of solar panels to power public buildings.



Energy efficiency remains another important lever for reducing city emissions, which has set a target of 7.5% for 2017-2025. The first smart thermostat was installed in 2017 to regulate the heating of a pilot building. New standards adopted in 2017-2018 require new public buildings to achieve "near-zero" energy consumption, and building permit concessions are granted to the private sector for low-energy buildings. Moreover, the city is improving its data management

and usage capabilities with the launch of the [3D Atlas 3D](#), which brings together all data relating to energy performance and consumption, heat leaks, etc. from buildings. It is also available to the various operators in the housing sector.

### • INNOVATIONS IN TRANSPORT AND WATER TREATMENT WHOSE IMPACTS ARE STILL TO BE OBSERVED •

Emissions from transport have changed little in recent years, with a decline of 9% since 1990 and 4% compared to 2016, representing around 20% of overall emissions. The city multiplied its initiatives in 2017 to encourage the use of public and soft transport and to achieve carbon neutrality in these categories in 2025: redevelopment of the network, 3-fold increase in cycle lanes, extension of the metro, fast-charging buses and more effective electric trams. Charging stations partially powered by solar energy and for electric cars have been installed. Other innovations have also proved their worth, such as the virtual health service enabling nurses to provide care remotely and avoid 200,000 km of travel, and an internet platform offering several business services such as carpooling, electric bikes etc.

Finally, Viikinmäki, Finland's biggest wastewater treatment plant, which treats the wastewater of 800,000 people including the residents of Helsinki, in 2013 became the first in the world to measure its emissions of different gases on a daily basis. Despite removing nitrogen before discharge into the sea, recently improved through denitrifying bacteria, the plant emits 134 tonnes/ year of nitrous oxide, in addition to 350 tonnes/ year of methane.

MAIN SOURCE:  
[ANNUAL ENVIRONMENTAL REPORTS OF THE CITY OF HELSINKI](#)





## Progress rewarded at regional level

A member of the Covenant of Mayors since 2015, the Izmir City Council has committed to reducing its emissions by 20% by 2020 from a 2014 baseline. An ambitious challenge for the third largest city in Turkey, which is growing in population and has a high rate of urbanisation. Achieving this objective involves modernising the city's public transport services and increasing the share of renewable energies in its energy mix. The [2014-2023 regional plan](#) drawn up by the Izmir Development Agency (IZKA) brings together these requirements. Izmir has been awarded the "Istanbul Prize for Environmentally Friendly Cities", recognising the commitment of Mediterranean coastal cities to quality of life and sustainable development. This prize falls under the "Mediterranean Strategy for Sustainable Development 2016-2025" (MSSD) which seeks to harmonise municipal environmental policies at the regional level.

### • MODAL SHIFT AND ELECTRIC VEHICLES AT THE HEART OF THE MOBILITY POLICY •

Transportation accounted for 54% of total GHG emissions in 2014. Since 2015, the city council has been implementing an ambitious plan to modernise its public transport network, aiming to compete with car travel and decongest peripheral roads. A new fast line (Izban) was added in 2010 to the metro network, connecting the airport to the city centre in less than 30 minutes. As part of its "Green Cities" programme, in 2018 the European Bank of Reconstruction and Development granted a loan of EUR 80 million for the construction of a new 7.2km metro line at a total estimated cost of EUR 250 million, which follows the financing of 85 metro trains in 2014 (EUR 23 million) and three new ferries in 2013 (EUR 33 million).

Izmir's "Green City Action Plan" is therefore seeking a 15% reduction in public transport-related GHG emissions (BERD 2018). Additionally, ESHOT, the public operator of the city's bus network, has put 20 electric buses into operation, with a target of 400 vehicles by 2020. Finally, the city has implemented an active policy in favour of soft mobility thanks to initiatives such as the creation in 2014 of a BISIM bicycle sharing system with 31 stations along the bay, or the extension in 2017 of its network of cycle paths from 39 km to 90 km. Izmir participated in "European Cycling Challenge 2016" and has plans to join the EUROVELO European cycling network.

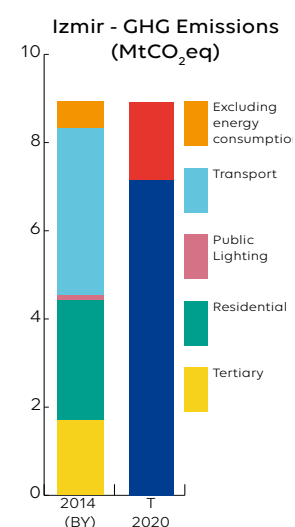
### • A REBALANCING OF THE ENERGY MIX IN FAVOUR OF RENEWABLE ENERGIES •

The city of Izmir, like the

rest of Turkey, is highly dependent on fossil fuels, which represent 76% of its energy consumption.

However, the Izmir City Council has been working since the 1990s to become an innovation centre for renewable energies in Turkey, thanks to a policy of attraction towards industries in these sectors (Ormat, Enercon, TPI) and towards the concentration of research establishments. A reform of the legislation governing [electricity market regulation](#) in Turkey in 2016, aimed at promoting clean energy at the national level, enabled the city of Izmir to implement several initiatives for the development of geothermal and wind power, with targets of 175,000 MW and 2,540 MW of capacity respectively in 2023. In 2017, it was the leading wind energy producing region with installed capacity of 1,333 MW out of the 6,500 MW produced in at the national level (Izmir 2017).

The construction of a new waste treatment and recovery plant began in January 2018 in the north of the city. It has a capacity of 2100 tonnes/ day and was established as part of the Urban Projects Finance Initiative (UPFI) supported by the Union for the Mediterranean.





## Successful efforts thanks to energy efficiency



Following its accession to the [Covenant of Mayors for Climate and Energy](#), the municipality of Murcia defined its [Renewable Energy Action Plan in 2010](#). In 2015, the city reached its target of 20% reduction of GHG by 2020 compared to 2007. The region's emissions from industry being, however, excluded from this target owing to the lack of influence of the municipal administration on the latter, yet responsible in 2007 for 13.7% of emissions. The Action Plan sets two main targets: the reduction of atmospheric pollution and the reduction of the use of non-renewable energy including energy production, mobility, and energy efficiency. In 2007, transport alone was responsible for 39.7% of emissions, services for 19.7% and the residential sector for 16.7%. It should be noted that Murcia's GHG emissions were already 34.4% lower than the Spanish average in 2007.

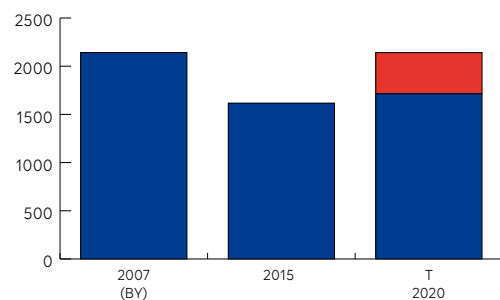
• **A PERFORMANCE DUE TO IMPROVEMENT OF ENERGY EFFICIENCY** • To reduce its GHG emissions by 20% by 2020, the municipality targeted its actions on the improvement of the energy efficiency of public structures and installations, private companies, and residential buildings.

The light points constituting public lighting and signalling systems for example have been gradually replaced by LED technology. LED traffic lights should enable a GHG emission reduction of 10,237tCO<sub>2</sub>eq/year. Private individuals also benefited from measures, in particular within the framework of [Murcia's Window Renovation Plan](#). 460 families in total benefitted from the Plan, for a total funding of €600,000. Finally, measures to improve the energy efficiency of municipal buildings enabled the laying of [24 photovoltaic installations](#) on their roofs, and the implementation of the [SmartSpaces](#) programme between 2012 and 2015 in six buildings, which enabled savings of 254tCO<sub>2</sub>/year. Lastly, presence sensors were installed to light common areas in municipal buildings. This measure alone should enable an emission reduction of 49,956tCO<sub>2</sub>/year.

• **THE DEVELOPMENT OF AN AMBITIOUS MOBILITY PLAN** • To reduce its emissions in the transport sector, the municipality of Murcia defined a number of measures in its Renewable Energy Action Plan concerning mobility, including a [Sustainable Urban Mobility Plan](#) launched in 2013. This plan enabled, in particular through the [Murcia Zona 30 plan](#) and the

creation of 95.5km of "30 zones" in the city centre, a viability study to be conducted on the installation of charging points for electric vehicles or the construction of park and ride car parks on the outskirts or near public transport stations. The two existing tramway lines were extended to cover 18km and 12km, respectively. The extension of the tramway network should enable a decrease in emissions of 7204tCO<sub>2</sub>/year.

Murcia - GHG Emissions (ktCO<sub>2</sub>eq)



Finally, the development of soft mobility is central in Murcia's new mobility policy, with the implementation of a free access bicycle service, "MUyBICI", initially including 60 stations and 600 bicycles, along with the construction of a cycle track network of 551km. In a first stage, bicycle rental stations were located in the city centre with a maximum distance of 300m, or 4 minutes on foot, between each station, to guarantee the best possible coverage. **The extension of the cycle track network should reduce emissions by 5330tCO<sub>2</sub>/year. In 2015, bicycle use increased by 5% in Murcia's modal share compared to 2007.**

MAIN SOURCE:  
[RENEWABLE ENERGY ACTION PLAN - MURCIA](#)

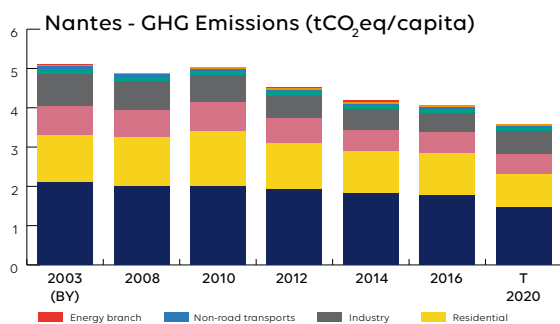




## The renewable heat network enables a drop-in carbon intensity

The Nantes targets correspond to the lines of the European Union's energy-climate package with targets that go beyond: -30% of GHG emissions and per capita energy consumption by 2020, and -50% by 2030, compared to 2003. The BASEMIS® 2008/2016 data show that the GHG emissions trajectory should make it possible to attain these targets (already -20% since 2003) on the condition of pursuing and reinforcing the actions already undertaken. For energy consumption, the 2008/2016 trajectory is less favourable, with an overall reduction of 13% since 2003.

• **THE CHALLENGE OF RENEWABLES AND RECOVERED HEATING** • In 2007, more than 50% of the territory's renewable production came from wood-energy (533GWh), then to a lesser extent from waste recycling (226GWh), geo-aerothermal systems (169GWh) and solar energy (27GWh). **Local renewable and recovered energies represented 12.4% of the energy consumption of the services and residential sectors for the Metropolis in 2017; i.e. a 73% increase compared to 2008.** The territory's share of local renewable energy must reach 50% of the consumption in 2050, with a 2030 target of 20%.



A key element in the mitigation strategy is the development of renewable heat networks; a central investment within the framework of the climate plan, voted in 2006. **In 2017, more than 30,000 housing units (i.e. 8%) were thus connected to one of the six heat networks, supplied to 67% (84% for that of Centre Loire, the most important one) by renewable or recovered energies (wood and waste incineration) and producing 324GWh.** In 2016, 52% of the heat distributed concerned housing, and the other 48% public facilities. With the commissioning, scheduled for 2019, of the Nord Chézine network, which is set to be 33km long and connected to the [waste treatment plant in](#)

[Couëron](#), 9500 additional homes will benefit from an eco-responsible heating mode. For households, this mode represents financial savings of 5 to 15% compared to gas heating. It should be noted that 46% of the social housing units in the City of Nantes were served by the heat network in 2016 (for a target of 50% in 2020). Thanks to this 110km network, 44,309tCO<sub>2</sub>eq were avoided.

• **THE E-BUSWAY PROJECT** • Nantes shows a significant decrease of its GHG emissions related to road transport. A pioneer in the relaunch of the tramway in the 1980s, it followed with the Chronobus and the Busway. The Busway (line 4) is one of the structuring axes of public transport in the Metropolis, with nearly 9.5 million journeys made in 2017, i.e. 40,000/day. At present, approximately 20 vehicles use these 7km-long reserved lanes. In the autumn of 2019, it will be renovated to become [the E-busway](#), with electric motorisation. Victims of their own success, the Busways are indeed congested during peak periods and must increase their capacity, their comfort, and their operation. **With 22 bi-articulated E-Busways of 24m and 150 seats each, 55,000 travellers will be able to be transported per day (35% more than today).**

The E-busway, which is 100% electric, offers a low energy cost, the absence of direct GHG missions (1330tCO<sub>2</sub> avoided) and a decrease in noise disturbance. A charging system will enable a continuous service. This project has financial support from the French State within the framework of the [Future Investments Programme](#) and from the EU under the [Horizon 2020 programme](#). It is also part of a coherent mobility policy, which also includes the development of soft modes of transport such as bicycles.

MAIN SOURCES:  
[LOCAL CLIMATE AIR AND ENERGY PLAN \(PLAN CLIMAT AIR ÉNERGIE TERRITORIAL - PLAN CLIMAT AIR ÉNERGIE TERRITORIAL \(PCAET\) AIR PAYS DE LA LOIRE - BASEMIS®](#)



## FRANCE PARIS

POPULATION  
2,220,445 (2017)  
SCOPE  
1, 2 ET 3 (LOCAL EMISSIONS +  
CARBON FOOTPRINT)

GHG TARGETS  
-25% IN 2020  
NEUTRAL BY 2050.  
(BASELINE: 2004)



## A new climate plan, the result of a wide-ranging consultation



Between 2004 and 2014, the country's carbon footprint decreased by nearly 10% (-2.6MtCO<sub>2</sub>eq) and energy consumption decreased by 7%. After a wide consultation gathering more than 700 proposals, the [Local Air Energy and Climate Plan \(Plan Climat Air Énergie territoriale - PCAET\)](#) was adopted unanimously in March 2018 by the Council of Paris, replacing a first plan designed in 2007. To reduce energy consumption by half by 2050, the City of Paris gives priority both to housing renovation and to the reduction of the most carbon-intensive transport modes; two fundamental actions to enable the gradual shift towards renewable energy and recovered energy (25% in 2020, 100% in 2050). In 2014, Paris consumed 17% of renewable energy, 5% of which was locally produced.



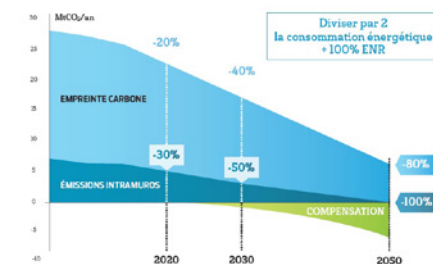
• **BUILDINGS: PRIMARY ENERGY CONSUMERS** • In 2014, Paris consumed more than 36TWh of energy, 85% of which by the 110,000 commercial and residential buildings. By 2050, more than one million housing units must have undergone thermal renovation. Since 2008, social landlords aim to reduce by 30% the energy consumption of 55,000 housing units by 2020. To date, 36,200 social housing units have been renovated or are undergoing renovation, and have enabled average savings of €360/year and more than 7500 jobs created. Moreover, "[Eco-rénovons Paris](#)" (2016-2020) aims to provide support to 1000 buildings in their renovation projects, and 328 condominiums (19,225 housing units) had already benefited from it in December 2017.

• **POLICY FOR SUSTAINABLE MOBILITY AND TAKING BACK PUBLIC SPACES** • This policy involves accelerating the change of behaviours (better shared vehicles, active travels), the development of public transport, and the end of diesel and petrol engines. Since 2001, it has enabled GHG emissions to be reduced by 39%, and the majority of atmospheric pollutants to be reduced by more than 50% via more than +700km of bicycle lanes, 23,600 "Vélib'" self-service bicycles, the extension of metro lines around Paris, and the creation of 24km of tramway. In summer 2017, five new districts benefited from the [Paris Respire](#) (Paris breathes) mechanism, which provides walkways in the lanes closed to traffic, on Sundays and public holidays. In addition, the Champs-Élysées and the capital centre are now dedicated to pedestrians and soft traffic on each first Sunday on the month.

• **INNOVATIVE FUNDING MECHANISMS** • Paris has been endowed with a territorial investment fund for

### LA TRAJECTOIRE CARBONE DE PARIS

Les émissions de gaz à effet de serre de Paris (25,6 millions de tonnes de CO<sub>2</sub> en 2014) se décomposent en deux grands ensembles :



the ecological transition, "[Paris Fonds Vert](#)". (Paris Green Fund). With an investment target of €200 million, and a first raising of funds of €100 million, the first investments in innovative SMEs in the building sector, mobility, energy, air quality or the circular economy can be made before the end of 2018. To accelerate the transition, Paris is studying the implementation of a carbon compensation mechanism to finance reduction and sequestration projects for irreducible emissions.

• **RESILIENCE, SOCIAL INCLUSION, AND SUSTAINABLE FOOD SYSTEMS** • To reduce the impact of urban heat islands and heat waves, a [Paris revegetation programme](#) has increased the gardens open to the public by 70ha in ten years. The adaptation strategy was integrated in September 2017 into a more exhaustive vision, by adopting the first Paris resilience strategy and adapting it to climate changes, reinforcing solidarity and facilitating inclusion. Finally, in May 2018, the country's first food strategy was adopted at the Paris Council to reduce the carbon footprint of the food sector (currently 18%). Via its Sustainable Food Plan, Paris has become, through its purchases in collective catering, the first public purchaser of organic food in France.

MAIN SOURCES:  
[BILAN 2004-2014](#)  
[PLAN CLIMAT 2018](#)

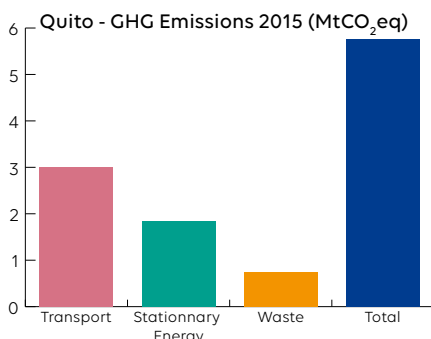


## Protection of ecosystems to reduce carbon footprint

In 2015, the emissions of the city of Quito were 5.8 MtCO<sub>2</sub>eq distributed as follows: 52% from transport, 35% from buildings and 13% from waste (C40). Quito, one of the capitals that is most engaged in local government networks (C40, ICLEI, 100 cities), is implementing real public investments in this direction. In the last four years, Quito has invested 10% to 12% of its overall annual budget in actions related to the adaptation and reduction of its emissions ([Action Plan 2015](#)).

### • ACCELERATED MODERNISATION OF MOBILITY •

Projections made up to 2025 assume an annual growth rate of 1.6% in public transport trips and 2.5% for private transport. This is an opportunity for the city of Quito to think in depth about its mobility strategy. In 2011, 69% of trips were made by bus and 31% by private car or taxi. To improve the fluidity of its system and prevent rising demand, many projects have been launched: **A first 22km metro line is under construction and is scheduled for commissioning in the second half of 2019. The city is also extending its electric trolley and expressways network (BRT) to the north; the network was established in 1995 and today is the most used system with an increase of 4% between 2014 and 2018.** These new stations are connected to the future metro to provide multimodal transport. Finally, Quito is seeking to promote non-motorised modes of transport, [prioritising pedestrians](#), cyclists and public transport users: it has recently pedestrianised 8 streets in its historic centre and 3 others were being pedestrianised in 2018 ([El Comercio](#)). Its action plan estimates the potential reduction of its strategy at 100,000 tonnes (or 0.1 MtCO<sub>2</sub>) per year, with numerous benefits for the city's air quality.



### • THE PROTECTION OF ECOSYSTEMS, AN ISSUE FOR THE METROPOLIS OF QUITO •

More than 60% of Quito's high-altitude territory is covered with vegetation and 56% of its natural vegetation is known to be vulnerable to climate change, including changes in temperature and precipitation, as well as increasing pressure from its population ([C40 2017](#)). To respond to these challenges, in 2007 Quito launched a system of territorial management of protected areas, integrated into the national system of protected areas. To achieve its goal of reducing its emissions by 5% per year, the city intends to manage the surrounding ecosystems as an integral component of its planning, including collaborative environmental governance by a range of stakeholders in the city to enable sustainable management of the land in all sectors (farmers, tourism, communities, etc.). **Its Geographic Information System (GIS) enables it to observe deforestation trends and prioritise the most vulnerable ecosystems to ensure continuity of ecosystem services and natural resilience. Today, this system has led to the establishment of six protected areas, a priority intervention area and an ecological corridor representing a total of nearly 175,000 hectares (SMANP).** In 2017, the city was trying to recover 60,000 hectares of previously degraded land, which could sequester about six million tonnes of CO<sub>2</sub> once restored, thus contributing to its 2025 targets ([C40 2017](#)).

### • AN APPLICATION TO RAISE CITIZEN AWARENESS AND PROMOTE CITIZEN INCLUSION IN THE PROCESS •

The Ministry of the Environment of Quito has developed fun and [easily accessible tools](#) that measure its carbon footprint and its equivalent in water consumption, depending on the activity carried out. ([Action Plan 2015](#)).



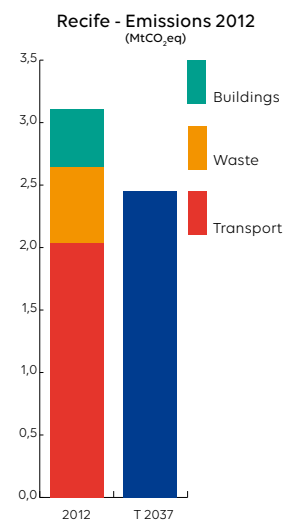
## An ambitious climate plan, incorporating the issues of increased vulnerability and the role of the informal sector

Selected by ICLEI as a “model city” for its [Urban LEDS](#) project, in 2014 Recife adopted an integrated climate mitigation and adaptation plan (PSMC), aiming to reduce emissions by 21.18% by 2037 from a 2012 baseline (3.12 MtCO<sub>2</sub>eq). In 2012 emissions were distributed as follows: 65.2% in transport, 19.4% in waste processing and sanitation and 15.3% in stationary energy. Recife reports that it emitted 2.3 MtCO<sub>2</sub>eq in 2015, i.e. 20% less than in 2012, and stated that this drop was due to the application of a new methodology considering biofuel as carbon neutral ([CDP 2017](#)). With the help of Aria Technology, in 2015 the city of Recife set up an interactive [CARBO COUNT](#) map to inform and raise the awareness of residents on emissions trends.

### • URBAN DEVELOPMENT, A VULNERABILITY FACTOR •

In 2007, the IPCC ranked Recife as one of the most vulnerable cities to climate change, in particular because of its very high population density on the coast and its average altitude below sea level. The urban development of Recife, which is mostly informal, has led to very uneven distribution of activities, which are concentrated in less than a third of its territory. The result is an almost complete disappearance of the green cover, growing urban soil sealing, and a concentration of transport and waste issues. To cope with this, Recife is counting on a policy of planting 100,000 trees in the city by 2020 and expanding its main “Capibaribe” urban park, which is expected to result in more per capita green space - from 1.2 m<sup>2</sup>/capita to 20 m<sup>2</sup>/capita by 2037 - and an emission reduction of 3.6 ktCO<sub>2</sub>eq/year from 2020, i.e. about 0.1% of emissions.

• **THE URGENCY OF URBAN MOBILITY** • With a 382% increase in the number of vehicles between 1990 and 2014 (from 251,423 to 1,211,218 cars) and a public transport service that has not kept pace with population growth, Recife is facing problems with congestion and large-scale public transport failures. To address this, the prefecture is working on the finalisation of BRT East-West / North-South lines and the establishment of BR corridors between each district of the city to promote public transport access and use. It is also setting up the creation of 76 km of cycle lanes, the recovery of 110 km of pavements and the expansion of the “Bike Pernambuco” self-service bicycle



programme (+700% ticket sales in the first half of 2018) to stimulate the use of soft transport. Finally, Recife is currently replacing all of its street and public lighting with LED lamps, which should reduce their emissions by 58%. All of these will lead to a decrease of 0.2 MtCO<sub>2</sub>eq in 2020 and 0.82 MtCO<sub>2</sub>eq by 2032.

### • THE CHALLENGE OF PROCESSING WASTE IN A SATURATED CITY •

0.6 MtCO<sub>2</sub>eq comes from a largely deficient waste treatment system, in which 99.6% of metropolitan waste is buried in landfills without any sorting, recycling or recovery of biogas, resulting in major pollution of the city’s rivers and canals. Recife is currently working on the construction of eight new eco-points and the creation of solid waste purchase and sale centres, in order to stimulate sorting behaviours within populations. It has also put in place a policy to promote the work of waste collectors with sorting bicycles in poor neighbourhoods - “bicicletas” - representing up to 40% of the collection in certain neighbourhoods. These policies aim to reduce waste-related emissions by 25% by 2032.

MAIN SOURCE:  
[PLANO SETORIAL DA SAÚDE DE MITIGAÇÃO E DE ADAPTAÇÃO À MUDANÇA DO CLIMA 2014 \(PSMC\)](#)



## Raise the awareness of the population about lower energy consumption

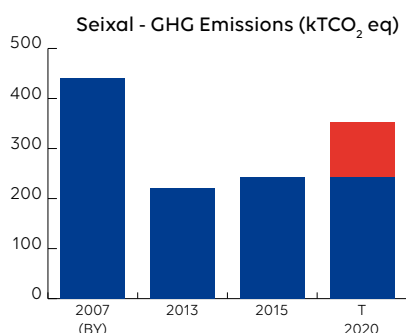
In 2011, the Portuguese district of Seixal, to the south of Lisbon, signed up to the Covenant of Mayors for Climate and Energy, one year after adopting its Renewable Energy Action Plan (PAES). The latter is the result of a partnership between the Municipal Energy Agency of Seixal (AMESEIXAL), the environmental division of the municipal council, with the participation of various stakeholders. It proposes three broad categories - Infrastructure, Transport, Citizen Awareness - to achieve a 20% reduction in GHG emissions by 2020 from 2007 (441 kt CO<sub>2</sub>eq), as set by the Covenant of Mayors. From 2013, the district of Seixal, having reduced its emissions by nearly 50%, exceeded its targets set for 2020. The drop-in emissions between 2007 and 2015 came mainly from the tertiary sector and residential housing (-63%) and transport (-27%). Most of these emissions come from electricity; improvement in its production and consumption is Seixal's main lever of action.

### • THE INDISPENSABLE DEVELOPMENT OF RENEWABLE ENERGIES IN SEIXAL'S ENERGY MIX

The application of Seixal's climate policy since 2007 has mainly led to a rebalancing of the city's energy mix in favour of renewable energies. In 2013, 36% of the city's final energy consumption was electricity, of which 58.3% came from renewable sources (Seixal 2017 Council). Five large renewable energy production units have been set up in the area since 2007. With annual production of 44 GWh, they provide 25% of the electricity supply of the population of Seixal, whose average consumption is 1,080 kWh/year/capita. **The region enjoys a high rate of sunshine, with 3,000 hours per year and three photovoltaic parks with 9,600 solar panels have been installed. A waste recovery plant, being tested since 2014, has also started up recently and is expected to increase biogas production (Seixal 2017 Environmental Charter).**

### • LOWER FOOTPRINT THROUGH CITIZEN AWARENESS

Of the 41 measures planned in the PAES, a dozen take the form of energy efficiency awareness campaigns (CM Seixal). Since 2012, the district council has been organising several awareness campaigns targeting residents and businesses in the city, which in 2007 accounted for 43.5% of total GHG emissions. These campaigns will run until 2020. To raise awareness among its businesses, the city offers them a free analysis of the annual trend in their consumption and ways to reduce it. A similar programme, Projeto Ecofamilias (Eco-family Project), has also been set up with about fifteen volunteer families per year. In addition, every year **the Annual Renewable Energies Exhibition is organised to enable inhabitants to explore possible alternatives in terms of heating and electricity, such as the installation of photovoltaic panels or heat recovery units.** Between 2007 and 2015, GHG emissions from the tertiary and residential sectors were reduced by 52kT CO<sub>2</sub> eq and 68kT CO<sub>2</sub> eq, respectively.



MAIN SOURCES:  
[PLAN D'ACTION POUR L'ENERGIE RENOUVELABLE - 2011](#)  
[RAPPORT DE SUIVI 2015](#)



## JAPAN TOKYO

POPULATION  
13,839,323 (2018)  
SCOPE  
1, 2 AND 3 (WASTE)

GHG TARGETS  
-25% IN 2020;  
-30% IN 2030  
(BASELINE: 2000)



## The Impact of the Emissions Trading Scheme



In 2012, Tokyo's emissions rose sharply after the shutdown of nuclear power stations and the recourse of coal. Despite a decrease of 1.6% between 2014 and 2015, the 66.3 MtCO<sub>2</sub>eq emitted in 2015 represented a 6.6% increase since 2000, and seems to put the 25% reduction in GHGs by 2020, formulated in the [Tokyo Climate Change Strategy](#) by the Tokyo Metropolitan Government (TMG), out of reach. Nevertheless, to consolidate this fall over the long term, special attention is being paid to commercial buildings, accounting for 43% of emissions, ahead of residential buildings (27%), transportation (18%) and industry (7.9%).

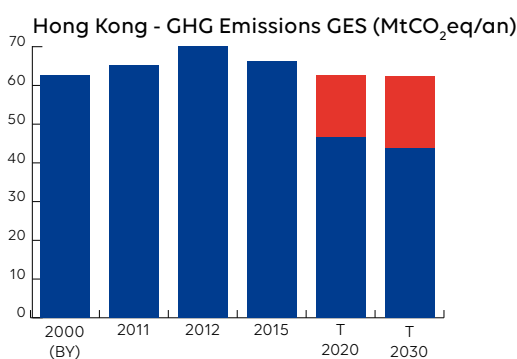
### • THE RESULTS OF PHASE I OF THE TOKYO-CAP-AND-TRADE PROGRAMME •

The Tokyo-Cap-and-Trade Programme, established in 2010, covers about 1,300 commercial and industrial establishments with energy consumption exceeding 1,500 hectolitres toe/year. They account for 20% of Tokyo's emissions and 40% of emissions from the commercial and industrial sector ([IETA 2018](#)). The results of Phase I (2010-2014) were particularly encouraging, showing a decrease of 12.7% over this period, i.e. a total cumulative reduction of 12.27 MtCO<sub>2</sub>eq. The evaluation report shows a reduction of 26% since the baseline year (2002-2007) from 16.50 MtCO<sub>2</sub>eq/ year to 12.13 MtCO<sub>2</sub>eq/ year in 2016 (TMG ETS 2018). Phase II is aiming for a reduction of 15 to 17% between 2015 and 2019, but for the moment, has only achieved a 1% decrease between 2015 and 2016.

The impact of these programmes can be seen in the evolution of Tokyo's final energy consumption which is decreasing rapidly, by 2.4% between 2014 and 2015 and by 21.1% since 2000, mainly in the industry and transport sectors, which recorded decreases of 40.8% and 41.7%, respectively, during the 2000-2015 period. At the same time, renewables account for more than 11% of final electricity consumption, notably due to the 8.5-fold increase in solar energy production capacity between 2008 and 2015.

### • TRANSPORT SPEARHEADS THE REDUCTION IN EMISSIONS AND ENERGY CONSUMPTION •

It is in transport that Tokyo is making the most progress with a decrease of 36.1%, or more than 6 MtCO<sub>2</sub>/year, between 2000 and 2015. In this area Tokyo has managed to follow its strategy in 2007: public transport, low-carbon vehicles and eco-driving. In 2018, its metro, connected to the largest metropolitan conurbation in the world, was the busiest in the world, with nearly 3.5 billion journeys ([UITP 2018](#)). For freight transport, Tokyo has put in place an energy efficiency indicator for 264 road transport companies and more than 10,000 vehicles. The publication and rating of their efforts is information valued by their customers and encourages them to promote eco-driving that has already reduced their emissions by 20%, and could reduce Tokyo's transport emissions by 8% ([CDP 2017](#)). Tokyo, however, has been seeking to stimulate more substantial investments, by progressively imposing CO<sub>2</sub> and particle emission standards since 2003, particularly for diesel vehicles, energy efficiency standards for vehicles in circulation, and low-carbon vehicle quotas, on companies based on the size of their fleet ([Retrofit program](#)).



The Tokyo strategy also includes a component involving 660,000 small and medium-sized enterprises representing the 60% of emissions from the industrial and commercial sector not included in the trading scheme: a dedicated Carbon Reduction Reporting (CRR) programme. The 23,786 institutions that reported their emissions in 2015 recorded a 13% decrease in their emissions between 2010 and 2014 (CDP 2017).

MAIN SOURCE:  
[REPORTS OF THE OFFICE OF THE ENVIRONMENT - METROPOLITAN TOKYO](#)



# 8 REGIONS ACROSS THE WORLD





## GERMANY

# BADEN WURTTENBERG

POPULATION  
11,023,425 (2017)  
SCOPE  
1, 2 AND 3

GHG TARGETS  
-25% IN 2020;  
-90% IN 2050  
(BASELINE: 1990)

## Industrial production distances the region from attainment of its 2020 targets

The founding state of the [Under2 MOU](#), Baden-Württemberg (B-W) made a commitment to reduce its GHG emissions by 80 to 95% by 2050 compared to 1990 ([agreement protocol](#)). According to [National Statistics Office of Baden-Württemberg](#), 78,4 MtCO<sub>2</sub>eq ont été émis dans la région en 2016 soit 2,4% de plus qu'en 2015. Il s'agit de la deuxième augmentation consécutive, même si la tendance globale des émissions de GES est à la baisse avec une diminution de 12% par rapport à 1990, soit 10,7 MtCO<sub>2</sub>eq/an en moins. Une réduction globale supplémentaire de 11,6 MtCO<sub>2</sub>eq/an est nécessaire pour atteindre son objectif 2020.

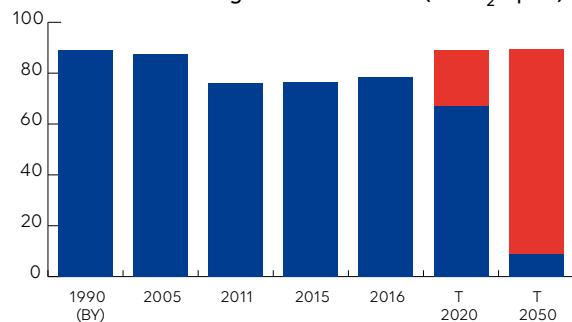
### • ENERGY TRANSITION AND INDUSTRIAL TRANSITION •

The energy transition of B-W is an ambitious challenge since it must simultaneously lead to the phase out of nuclear power decided by Germany by 2022, which is at the origin of nearly 50% of its electricity. Coal-fired and gas-fired plants will have to compensate for the lower nuclear energy production, in addition to the development of renewable energy. In 2025, the latter will have to cover 25% of the end-use energy demand, and 80% of the electricity production by 2050. **In 2016, renewable energy increased by 5% compared to 2015, and by 45% since 2006 to reach 50.8TWh, i.e. 12.7% of the primary energy consumption and 32% of the electricity consumption.** Biomass alone represents 70% of the primary renewable energy consumption, but since its resources are limited, its relative share is bound to decrease. The second major issue concerns industrial emissions resulting from chemical reactions in the production of aluminium, cement, glass, etc. and from the combustion of fossil fuels. **Industrial emissions related to energy increased by 10.2% compared to the previous year, to reach 10.2MtCO<sub>2</sub>eq. This increase is mainly attributable to the sectors of power plants, mineral oil treatment and the increase of demand in the other industries (+2.4%) (Statistik-BW 2018).**

### • THE LOW DEMAND FOR ELECTRIC MOBILITY •

Standing at about 30%, transport still represents most of the GHG emissions in 2016. Made up of 94% of road transport emissions, the 1.3% increase of its emissions in 2016 is in particular due to **freight transport, whose emissions increased by 58.6% between 1990 and 2016. On the other hand, those of passenger transport (cars, buses, motorcycles) decreased by 4% and reached**

Baden-Wurttemberg - GHG Emissions (MtCO<sub>2</sub>eq/an)



**13.4MtCO<sub>2</sub>eq in 2016, representing 57% of the emissions from road transport.** The 27% decrease of specific emissions (quantity of CO<sub>2</sub> per travelled kilometre) of private cars was not sufficient to compensate for the increase of the annual mileage (+32.5% compared to 1990) and the resulting emissions. To that end, B-W has planned the electrification of the whole vehicle fleet by 2030 ([Goals 2030](#)). **In 2017, 1800 charging points were available in the region (1/6 of the national total) but electricity still accounts for only 1.5% of the total energy consumed by transport (emobil-sw 2018).**

### • METHANE CAPTURE •

The waste management policy shows a 5.8% reduction of GHG emissions compared to 2016 and a 74.8% reduction compared to 1990, and they now account for only 1.4% of GHG emissions. The prohibition in Germany of landfilling untreated organic waste and the greater efficiency of methane capture from landfills have led to a significant reduction of methane emissions. The association of local authorities (Special Purpose Association) formed in the State of B-W for waste management is considered as an example in this respect ([GIZ 2016](#)).

MAIN SOURCE:  
[HTTPS://UM.BADEN-WUERTTEMBERG.DE/DE/STARTSEITE/](https://um.baden-wuerttemberg.de/de/startseite/)



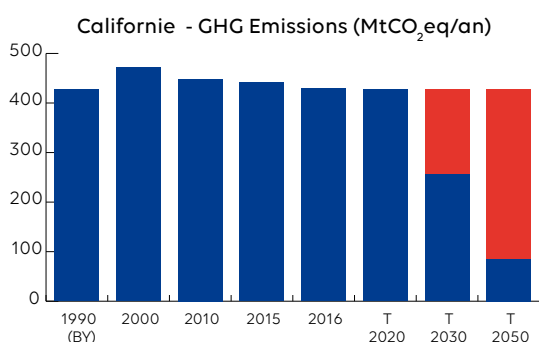


## Results of electricity decarbonisation

California, leader in the United States for climate policy, made a commitment in 2006 to reduce its GHG emissions in 2020 to the level of 1990, i.e. about 15% compared to a “business as usual” scenario. California reached this first milestone in 2016, even though its GDP has continually increased since 2002. Whereas most emissions reductions over the last period came from the decarbonisation of the electricity sector, the transport sector now offers the main potential reduction with a view to achieving the recently adopted 2030 and 2050 targets.

### • A STRONG POLICY IN SUPPORT OF RENEWABLE ENERGY

Since the end of the 1990s, the California State financially supports the development of renewable energy. In 2015, it set, via the [Renewable Portfolio Standard](#) a target of 33% of the electricity consumed in California produced from renewable energy in 2020, 50% in 2030, and in September the target to reach 100% of renewable energy by 2045 (IISD 2018). According to the [California Energy Commission](#), this ratio was already 32% in 2017. In the pursuit of this objective, one of the central public policies is the [Go Solar California](#), plan, initiated in 2007 with a budget of 3.35 billion USD. With various incentives (tax credits, subsidies, guaranteed feed-in tariffs on small installations, and so on) it facilitated the installation of 7.2GW. In 2015, the emissions of the electricity sector were 29% lower than those of 1990.



### • A RAPIDLY GROWING CARBON QUOTA EXCHANGE SYSTEM

A major tool in the fight against emissions, the Californian carbon quota exchange system launched in 2013 is at present the second largest in the world (I4CE 2018). It is also coupled with the Quebec exchange system since 2014. It applies to large power generation companies, fossil energy distributors, and

industrial installations, i.e. a total of 450 companies accounting for 85% of Californian emissions (C2ES). The quotas, distributed according to a method combining free allocation and auctions, are planned to decrease by 3% per year on average between 2015 and 2020, and more quickly over the 2021 - 2030 period in order to guarantee a minimum price. At present, it is difficult to assess the real impact of the Californian carbon market (Berkeley 2018).

### • THE CHALLENGE OF THE ELECTRIC CAR

The targets set by California require a significant decarbonisation of the transport sector, whose emissions are currently increasing. They account for 41% of the State's emissions compared with 24% in the whole of the United States. The strategy pursued is based mainly on the decarbonisation of individual mobility. The State has furthermore joined the “Zero Emission Véhicule” initiative within the framework of the Under2 Coalition, which targets 100% of so-called “zero emissions” vehicles by 2050. A central initiative, the “Advanced Clean Cars Program”, set up in 2012, sets maximum levels for GHG emissions and local pollutants, and obliges vehicle manufacturers to produce a quota of electric vehicles. The “Low Carbon Fuel Standard” programme, adopted in 2009 and renewed in 2015, aims at reducing the carbon intensity of fuels by 10% between 2009 and 2020. California is also leading the way in terms of public support to the development of electric mobility. A [plan for development of the sector](#), voted in May 2018, includes a public investment of 768 million USD in the financing of charging points to enable the commercialisation of 5 million electric vehicles by 2030.



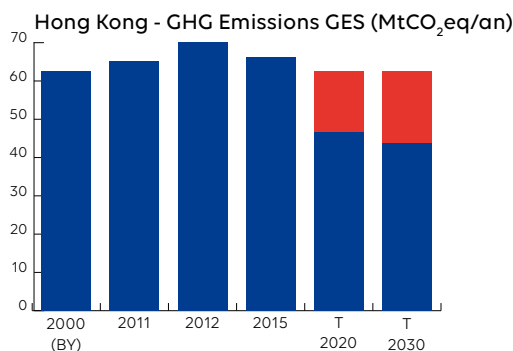
## Gasification of the electric mix



Hong Kong has declared its ambition to reduce its carbon intensity by 50% in 2020 and by 65 to 70% by 2030, compared to 2005. This equates to an absolute reduction in emissions of 20% by 2020 and between 26% and 36% by 2030 ([Climate Plan 2030+](#)). The 7.5% fall in GHG emissions in 2015 (from 45 to 41.7MtCO<sub>2</sub>eq) came after almost constant increases since 1990. The fall was even more pronounced per capita (-8.4%, the lowest since 2004 with 5.7 tCO<sub>2</sub>eq/ capita) and per point of GDP (-9.7%: the lowest since 1990 with 0.017 kg CO<sub>2</sub>eq/ HK Dollar GDP). An equivalent drop each year would be necessary, however, for HK to reach its 2020 target.

### • ELECTRICITY GENERATION: THE MAIN LEVER FOR REDUCING EMISSIONS

90% of electricity generation is used to supply buildings which is by far the main source of emissions with 66% in 2016, ahead of transport (18%) and waste (5.9%). The decrease in 2015 was entirely attributable to the replacement of several coal-fired generating plants with natural gas, leading to a 10% drop in emissions from electricity generation ([Gov HK 2016](#)). By 2020, HK intends to double the share of electricity from natural gas (27% in 2015) to meet growing demand, and, conversely, to halve the share of coal (50% in 2015).



Its 2030 action plan also includes 25% non-fossil electricity, but the limited structures in the region using renewable energy account for less than 1% of the Hong Kong mix (e.g. the 25% solar-powered water treatment plant in Siu Ho Wan Bay). The new contract established in 2018 with the two power companies (CLP Power and HK Electric) for the next 15 years introduces a purchase price funded in part by the sale of "renewable energy certificates" (RECs) to companies that would volunteer

to reduce their emissions. This system is expected to achieve 3 to 4% of renewables in the electricity mix by 2030. This non-fossil share therefore mainly involves nuclear electricity imported from China, with which HK signed an agreement in 1994, providing 25% of its needs, which was recently renewed until 2034.

### • CONTROL OF DEMAND AND ELECTRIFICATION OF PUBLIC TRANSPORT

In addition to the code imposing energy efficiency standards for new buildings and renovation projects, the HK region introduced a mandatory "MEELS" labelling system in 2008, progressively extended to all household appliances, air conditioning systems, etc. available on the market (phase 2 in 2015 and phase 3 in 2018). Its 2015 upgrade should enable an annual saving of 300 million kWh. Furthermore, the region is asking companies within its borders to produce and publish their carbon footprint on the [Carbon Footprint Repository platform](#), on which 83 companies are already present ([Gov HK 2018](#)). With 90% of journeys already made by public transport in 2015, the challenge for the Hong Kong government is to improve the energy efficiency of its trains and public buses ([Gov HK 2017](#)). In 2011, it provided the HK \$ 300 million (EUR 33 million) Pilot Green Transport Fund, open to public transport and freight vehicles operators for the acquisition of more efficient vehicles (electric, hybrid, innovations for trains and boats). [The 22nd project selection session](#) in May 2018 brought the number of funded projects to 124 for a total funding of HK \$ 134 million, almost half of the funds made available.

\*Special administrative region of Hong Kong

MAIN SOURCES:  
[CLIMATE READY HK](#)  
[CLIMATE ACTION PLAN 2030+](#)



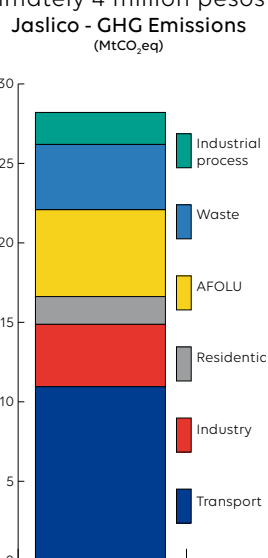
## The administration sets the example in terms of carbon footprint reduction

The State of Jalisco, a member of the Under2 Coalition, has made a commitment to reduce its emissions by 80 to 95% by 2050. Jalisco has several major tools ([click here for the video](#)) for its climate policy with the adoption of the 2015 climate change action law, which enabled the implementation of the [inter-institutional commission](#) to coordinate and implement its climate policy, and finally [an Energy Agency](#) whose mission is to ensure security and energy efficiency and the production of clean energy. Its 2018 action plan, drawn up following a [wide public consultation](#), estimates GHG emissions in 2014 at 28.4MtCO<sub>2</sub>eq, also taking into account land use-related emissions and distributed as follows: energy 60% (16.9MtCO<sub>2</sub>eq), Agriculture, Forest and Other Land Used (AFOLU) 19% (5.5MtCO<sub>2</sub>eq), waste 14% (4.1MtCO<sub>2</sub>eq) and industrial processes 7% (2MtCO<sub>2</sub>eq). Transport alone represents 39% of Jalisco's total emissions. Per capita emissions reached 3.63tCO<sub>2</sub>eq in 2014, compared with a national average of 4.16tCO<sub>2</sub>eq in 2013 (INECC, 2015).

### • JALISCO – ADMINISTRATION: A PRIORITY TO LIMIT GHG EMISSIONS •

In 2014, Jalisco was one of the two Federal States that benefited from the "Low Carbon States of Mexico" pilot programme, which aims to support them for one year for the elaboration of an emissions management plan for their administration (issued in 2016) and to provide them with means to achieve significant savings on energy costs, to reduce its emissions due to energy combustion by 40% by 2018 (compared to 2013). The energy efficiency measures taken following this project and introduced in the public administration represent savings equivalent to the electricity used during a one-year period in 2794 homes, or to stopping the traffic of nearly 4000 private cars each day. The savings made for an optimal use of electricity in public buildings represent approximately 4 million pesos per year.

In 2017, efforts were focused on the replacement of traditional lights by LED-type lights in the installations of the Ministry of Culture (SC), the Ministry of Infrastructure and Public Works (SIOP), and the Mobility Secretariat (SEMOV). With these



MAIN SOURCES:  
[JALISCO STATE'S ACTION PLAN TO TACKLE CLIMATE CHANGE 2015-2018](#)  
[TOOLS OF JALISCO'S CLIMATE POLICY](#)

measures, the government plans to reduce greenhouse gas emissions resulting from the energy consumption of public installations by approximately 20% by the end of 2018, compared to 2014.

### • PROMOTING SILVOPASTORAL LIVESTOCK FARMING TO REDUCE THE CARBON FOOTPRINT OF LIVESTOCK •

The State of Jalisco is the second with the largest rate of deforestation, with 522,000ha lost and 493,000ha degraded between 1993 and 2012 (CONAFOR, 2016). The AFOLU sector is responsible for 19% of the GHG emissions of the territory. 65% of these emissions come from [livestock farming](#) and in particular swine and cattle farming, which accounts for 95% of emissions related to enteric fermentation. To reduce these emissions, Jalisco has been banking on the increase of silvopastoral livestock farming and on the conservation of pasture biodiversity since 2016. In collaboration with 36 municipalities grouped together in associations of municipalities for sustainable development and with the University of Guadalajara as a technical partner, 22 projects have already been launched for which the State of Jalisco finances half of the costs, up to 200,000 USD. In addition, via a REDD payment system, the State supports the implementation of [low-carbon rural development projects](#) in the coastal basins: preservation of the fauna and flora, conservation agriculture and agroforestry, etc.



# ITALY LOMBARDIA

POPULATION  
10,031,195 (2017)

GHG TARGET:  
-20% IN 2020;  
-40% IN 2030;  
-80% IN 2050  
(BASELINE: 2005)



## All-out focus on energy efficiency



With a 16% fall in GHG emissions in 2016 compared to 2005, Lombardy is nearing the targets it announced in its Regional Programme for Energy and the Environment (PEAR), in line with the 2020 and 2030 European targets. However, several external parameters must be taken into account to explain this fall: the economic crisis of 2008 which led to a lasting fall in regional GDP, regional deindustrialisation and the fall in energy demand due to rising average regional temperatures. Under the Under2MoU, the region has also committed to a 10% reduction in total energy consumption and to covering 15.5% of regional demand from renewable energies in 2020.

### • PLANNING FOCUSED ON THE GOAL OF REDUCING ENERGY CONSUMPTION •

EUR 96 million from the European Regional Development Fund (ERDF) has been allocated to the energy efficiency of public buildings, of which 52% belong to class G (the most energy consuming). They must reduce energy consumption by between 1.7 and 2.7 million tonnes of oil equivalent (Mtoe) based on consumption of about 24 Mtoe, a fall of between 7 and 11%. Of this sum, EUR 63 million (M €) were allocated in 2017. A third was dedicated to municipalities with fewer than 1,000 inhabitants, to finance up to 90% of their renovation projects. The rest was spent on projects of more than EUR 1 million in buildings with almost zero energy (NZEB), of which 30% of expenses are covered and 40% are financed **by a low-interest 10-year loan in its first monitoring report at the end of 2017, the regional council declared that it had funded 101 projects in small districts, with 19 beneficiaries for 32 NZEB projects. The whole mechanism is estimated to have covered 123,000m<sup>2</sup>.**

of private companies. €45 million was therefore dedicated to projects enabling the pooling of services using the electricity grid, for example in the field of remote monitoring or telecommunication. By the end of 2017, funding applications were still in the investigation phase.

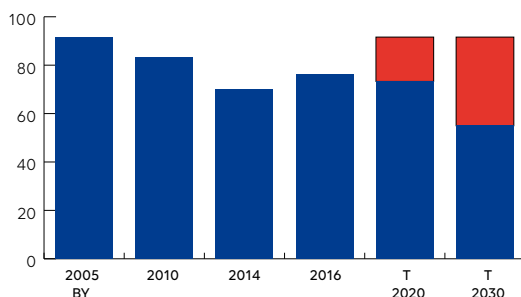
### • SUPPORT FOR THE DEVELOPMENT OF ELECTRIC MOBILITY BY FINANCING CHARGING STATIONS •

Two separate initiatives to support electric mobility are provided by the PEAR [and the Regional Transportation Planning Document](#). The first, with funding of EUR 1 million, enabled the construction of 179 charging points for individuals by the end of 2017. The second aims to develop coverage of the area with public charging points through a EUR 20 million call for tenders for municipalities with more than 30,000 inhabitants. **According to the 2017 follow-up report, 688 terminals have been made available to the public through these programmes.**

### • SUPPORT FOR RENEWABLE ENERGIES AS THE NORM •

With renewable energy production of 16,330 GWh in 2016, the Lombardy region has already exceeded its previous target of covering 11.3% of its final renewable energy demand by 2020. In the Italian regulatory framework, support measures for renewable energy production are the responsibility of the state. The role of the region is limited to facilitating administrative authorisation procedures. **Under the PEAR, the main measure is the pre-identification of areas suitable for the installation of renewable energy sources. This division of the area represents a time saving and a reduction of the risk incurred for the developers of renewable projects.**

Lombardia - GHG Emissions (MtCO<sub>2</sub>eq/an)



The plan also prioritises the issue of public lighting, which accounts for 60% of the electricity consumption of the regional administration and 2 to 10% of that

MAIN SOURCES:  
[INEMAR EMISSIONS INVENTORY](#)  
[PROGRAMMA ENERGETICO AMBIENTALE REGIONALE 2014 \(PEAR\)](#)



## Agriculture: A central issue

As the third economic power in Brazil, the State of Minas Gerais is often described as a “concentration of Brazil”, owing to the very strong territorial and social disparities within its territory. In 2014, it undertook the development of a Local Climate and Energy Plan ([PEMC](#)), then considered as pioneer in Brazil. This plan establishes that in 2014, the emissions of Minas Gerais were 124MtCO<sub>2</sub>eq, i.e. a 24% increase compared to 2005 (99.5MtCO<sub>2</sub>eq). They are distributed as follows: agriculture (40%), energy (37%), industrial processes (16%), waste (7%).

### • AGRICULTURAL POLLUTION AND DEFORESTATION •

Minas Gerais is the second State of Brazil in terms of livestock (23.8 million cattle in 2015) and agricultural production (rice, sugar cane and grain) with a production increasing steadily by 2% per year since 2005. **This growth has led to a 22% increase of emissions in the agricultural sector between 2005 (16.2MtCO<sub>2</sub>eq) and 2014 (19.8MtCO<sub>2</sub>eq)**, half of which is due to land use changes and deforestation. In 2010, Minas Gerais implemented a series of [law](#) to, for example, drastically limit the practice of agricultural waste burning in plantations. This resulted in a 75% decrease of emissions related to agricultural waste between 2009 and 2015, falling from 0.66 to 0.16MtCO<sub>2</sub>eq. In parallel, Minas Gerais set up a large programme in 2016 for the recovery of degraded pastures and limiting the effects of deforestation, which is the cause of 17% of emissions in the sector. 715 producers were trained in techniques enabling a better management of their activity, the recovery of degraded areas, and increased production and incomes of rural producers ([FAEMG 2018](#)).

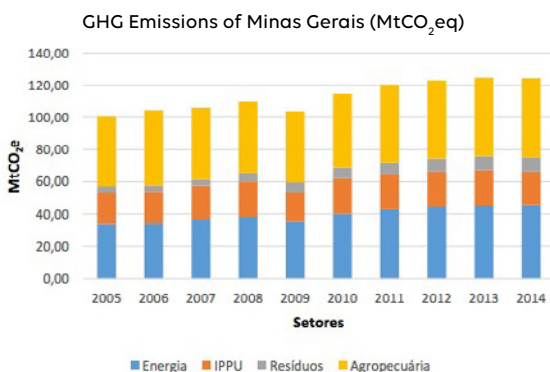
### • IMPROVING ENERGY EFFICIENCY IN THE INDUSTRY •

In 2014, nearly one third of emissions due to energy combustion came from industrial production.

The 3% decrease of the GDP in 2009 compared to 2008 resulted in an 8% decrease of total emissions in Minas Gerais. This decrease is directly explained by the retraction of the metal industry, which saw a 39% decrease of its production in 2009, and an 8% decrease of its CO<sub>2</sub> emissions. Since the economic recovery of the sector in 2011, however, emissions have increased by 12%. In order to attempt to reduce the carbon and energy intensity of the industry, Minas Gerais has set up a financial support [programme](#) for the modernisation of industrial processes and the reduction of their energy consumption, aiming at reducing emissions by 79,537tCO<sub>2</sub>eq by 2030, such as: the use of natural gas to run the turbines, the renewal of heavy goods vehicle fleets for larger vehicles that use bio-fuels, or the integration of variable-speed compressors into industrial fans so as to optimise the latter’s energy consumption. In 2015, the benefits of these various measures were estimated at 500tCO<sub>2</sub>eq.

### • MEASURING AND COMBATING SOCIAL AND CLIMATE VULNERABILITY •

Frequently affected by extreme climate events such as droughts and floods, Minas Gerais was the first State of Brazil to perform a diagnosis of vulnerability to climate change in [2010](#), updated in [2015](#). In 2015, the Development Bank of Minas Gerais (BDMG) and the French Development Agency financed the creation of an index of Vulnerability of Minas Gerais ([IMVC](#)) to measure the vulnerability of the State’s territories to impacts related to climate changes, as well as a call for projects aimed at municipalities for mitigation and adaptation projects.



MAIN SOURCES:  
[PLANO DE ENERGIA MUDANÇAS CLIMATICAS \(2015\)](#)  
[ESTIMATIVAS DE EMISSÕES E REMOÇÕES DE GASES DE EFEITO ESTUFA DO ESTADO DE MINAS GERAIS - ANO BASE 2014](#)



FRANCE

NOUVELLE AQUITAINE

POPULATION  
5 911 482 (2015)  
SCOPE  
1, 2

GHG TARGETS:  
-45% IN 2030  
-75% EN 2050 (BASELINE 2010)  
CARBONE NEUTRAL IN 2050



## Bringing stakeholders together and structuring sectors



GHG emissions amounted to 49.5 MtCO<sub>2</sub>eq in 2016, a 7% decrease since 2010, mainly attributable to the residential and tertiary sectors (-20% and -18%), industry (-14%), waste (-10%) and, finally, the movement of people (-3.6%). For its action, in 2016 the Region created the Permanent Council for Energy Transition and Climate (**COPTEC**), an operational governance tool to enable, internally, energy objectives to be included in all regional policies and, externally, to form a regional committee of 530 public and private organisations. It supports the pooling of practices and co-construction of regional policies. The idea is to structure operational channels in various sectors: eco-materials, sustainable mobility, [energy and storage cluster, etc.](#)



### • REDUCING OUR GHG EMISSIONS THROUGH SUSTAINABLE MOBILITY AND ORGANIC FARMING •

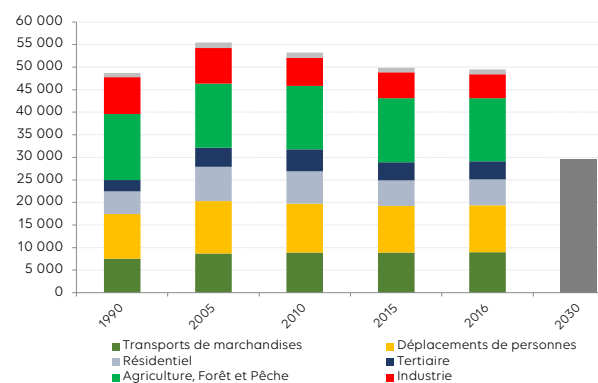
The transport sector is the main source of emissions with 38% of GHGs including 21% individual journeys and 17% for freight. The region is promoting the modal shift of freight to rail and of people via pooling (car sharing), the multiplication of [third workplaces](#) and soft commuting (cycling and walking). In September 2018, for example, the region proposed a 50% reduction in regional train passes and announced 1,000 discounted tickets (between EUR 5 and EUR 20) on regional routes. It is also centralising mobility policies with the creation of the [SMINA \(syndicat mixte intermodal de Nouvelle Aquitaine\)](#) and the deployment of energy distribution infrastructures for alternatives to fossil fuels (electricity, CNG, hydrogen) for the roll-out of “clean” vehicles by 2050.

The agricultural sector, the second largest source of GHG emissions, benefits from [the Bio ambition regional pact launched in 2017](#), a unique plan in France that brings together organic farming stakeholders around a shared target of 10% organically farmed land by 2020 and 20% by 2027. **The 2017 results are very encouraging with more than 5,000 organic farms representing 200,000 ha and four departments close to the 10% target.**

### • ENERGY SAVING IS THE PRIORITY •

As the third highest source of GHG emissions, the building sector is the largest energy consumer with 38%, including heating, which is the largest source of emissions in the sector (73% of the residential sector and 63% of the tertiary sector), due to the majority use of natural gas and oil-based products. To achieve its goal of

Evolution des émissions globales de GES en Nouvelle-Aquitaine - en kt CO<sub>2</sub>e



reducing final energy consumption by 60% by 2050, the region is supporting individuals with 10,000 tracked renovations (audit, third-party financing) representing savings of 84,000 tCO<sub>2</sub>eq avoided. It thus seeks to stimulate the energy renovation market by providing a model for building professionals and banks. The region is also leading the way in constructing the eco-materials sector with the [“Building of the Future”](#) call to tender for technical and financial support for the most exemplary renovation and construction projects. In addition, the region supports companies of all sizes to improve the energy efficiency of industrial processes by at least 10% in three years.

Renewable energies already accounted for 23.2% of final energy consumption in 2016 and Nouvelle-Aquitaine is now the leading producer of photovoltaic electricity with 26% of national solar resources. The [“Participatory and citizen”](#) call for projects in 2017 and 2018 also supports citizen projects for energy efficiency and renewable energies.

MAIN SOURCES:  
[ACCLIMATERRA \(2018\)](#)  
[ANNUAL SUSTAINABLE DEVELOPMENT REPORTS IN NOUVELLE AQUITAINE](#)





## The Cap-and-Trade emissions allowances system at the heart of the strategy

In 2013, Québec adopted its new 2013-2020 [Action Plan on Climate Change](#) (PACC) which aims to reduce GHG emissions by 20% by 2020. This plan is subject to [twice-yearly assessments](#). The first three years of implementation of the PACC will therefore result in a reduction of 1.4 Mt CO<sub>2</sub>eq / year. In 2015, during the review of the plan, additional investments of \$66 million were announced, together with the setting up of actions for Francophone countries that are the most vulnerable to climate change - \$25.5 million mainly in Africa. As Quebec's electricity mix is 97% hydroelectric, the main sectors affected by the PACC are transportation, industry and buildings. In 2009 they accounted for 43.5%, 28% and 14% of GHG emissions respectively. The many efforts made since 2006 have enabled it to post one of North America's best per capita emissions reports at 10 tCO<sub>2</sub>eq/ year/capita.

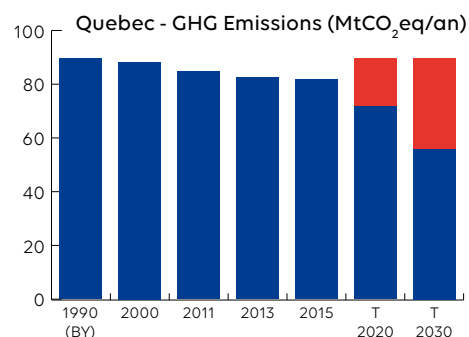
### • A SELF-FUNDED PLAN THROUGH THE EMISSION CAP-AND-TRADE SYSTEM (SPDE) •

From 2007, Quebec introduced a tax on fossil fuels, **before the introduction of the "SPDE", emissions quota system in 2013, coupled with the California State Carbon Quota System (WCI)**. It affects companies emitting more than 25,000 tCO<sub>2</sub>eq/ year. In the first 2013-2014 period, it imposed an emissions cap on the industry and electricity sectors only. 100% of companies covered by the SPDE fulfilled their obligations by paying the Québec government for an emission allowance for each tonne of CO<sub>2</sub> emissions produced. These emissions units may be distributed free of charge, auctioned or sold over-the-counter by the government to companies. As of 2015, the SPDE now includes fossil fuel distributors, and the number of emissions permits issued by the government is being reduced each year. The revenues it generates are fully earmarked for the [Green Fund](#) the main funder of the PACC.

### • QUEBEC'S FREIGHT TRANSPORT: THE MAIN SOURCE OF EMISSIONS FROM TRANSPORTATION •

With 41% of total emissions in 2014 and an increase of 20.4% since 1990, the transportation sector is the largest GHG emitter in Quebec. Road transport is the main source of transport-related emissions, with emissions almost doubling from 4.83 to 9.19 MtCO<sub>2</sub>eq between 1990 and 2014. The Quebec government is therefore running 11 programmes dedicated solely to mobility.

Since 2017, the [Eco-trucking programme](#) has been providing financial support for companies to adopt low-carbon, more energy-efficient technologies in freight vehicles: the purchase of hybrid vehicles, auxiliary



systems for fuel consumption reductions related to the operation of equipment, or aerodynamics. It also funds studies to improve logistics within companies, therefore reducing travel. In 2015-2016, over C\$ 6.5 million in financial assistance was granted to 892 applications for the installation of 6,787 facilities. As of 31 March, 2016, the programme had reduced emissions by 228,328 ktCO<sub>2</sub>eq.

For individuals, the C\$ 120 million "[Drive Electric](#)" programme has been offering C\$ 8,000 for the purchase of an electric vehicle and C\$ 600 for the installation of a 240-volt home terminal since 2015. The number of electric and hybrid cars thus rose from 5,684 to 9550 in that same year. Quebec is the first province in Canada to pass a law requiring manufacturers to offer more certified Zero-Emission Vehicles (ZEV).

MAIN SOURCE:  
[013-2020 CLIMATE CHANGE ACTION PLAN](#)

## SECTION III



# Around the World in 80 initiatives



A GLOBAL PICTURE OF RECENT CLIMATE  
ACTIONS TO CAPTURE TRENDS AT WORK  
IN 10 SECTORS OF TERRITORIAL PUBLIC  
POLICIES.





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the Lyon-Confluence sustainable district

### CHINA

The world's first forest city being built in Liuzhou

### SPAIN

Durango's innovative urban planning tool

### MOROCCO

Zenata eco-city, a new sustainable city

### BURKINA FASO

Yennenga, the new sustainable city

### UNITED STATES

Columbus, Ohio, at the forefront of modal planning

### ALBANIA

Tirana inaugurates the largest pedestrian zone in the Balkans

### INDIA

West Bengal, New Town, the green city



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Istanbul, a turbine produces energy from traffic

### FINLAND

A hybrid thermal grid in Ristiina  
In Capelle-la-Grande, green hydrogen is being injected into the natural gas grid

### INDIA

State of Chhattisgarh: 900 electrified centres thanks to solar panels

### CHINE

Chongqing/Yunnan/Sichuan/Guizhou, group their hydroelectric plants

### PORTUGAL

Vila Nova de Gaia produces one third of its power locally

### BELGIUM

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# URBAN PLANNING

## AROUND THE WORLD IN 80 INITIATIVES

**By modelling the shape of the city, urban planning strategies guide its functions and the collective behaviour of its inhabitants and is, therefore, of significance in respect to CO<sub>2</sub> emissions. Wherever they are implemented, new approaches to urban spaces (eco-neighbourhoods, eco-cities, smart cities, etc.), which cover a wide range of initiatives, aim for sustainable management of space, relocalised lifestyles and combine a concern for energy savings and reductions in greenhouse gas emissions (GHG). There are numerous examples of these major development trends: making cities greener and smarter while reducing urban sprawl. The following is a sample of these initiatives.**

Depending on their legal competences, cities and regions can link local, national and international climate goals to the traditional regulatory and legal planning levers that they have available. Recently, some cities have distinguished themselves by demonstrating innovation in the creation of new instruments to facilitate the implementation, management and monitoring of such projects. As part of the adaptation of its public space to climate change, Durango (Spain) has developed a tool to categorise different parts of the city in order to evaluate the transformations they require. By embracing the principles of efficiency and the socio-environmental virtue of smart cities and eco-neighbourhoods, large cities support climate goals by renewing their urban amenities or reorganising the sharing of public space. For example, New York, which in September 2017 announced that it had already converted 70% of its lighting to LEDs, or Tirana which has inaugurated the largest pedestrian zone in the Balkans.

Another trend is the greening of public spaces which leads to increasingly innovative collaborations between architects, urban planners, real estate businesses and local governments. Integrating vegetation with urban amenities and increasing green spaces can create shade, make streets cooler and combat air pollution. For example, in May 2018, Wycombe became the first English town to require developers to include canopy coverage over 25% of new built surfaces. More spectacularly, in 2017, China unveiled Nanjing Vertical Forest, a tower block engulfed in a thick layer of plants producing oxygen and absorbing CO<sub>2</sub>, based on the vertical forests in Milan and

Lausanne. These large-scale projects are at the forefront of initiatives in the verticalisation and greening of buildings in cities. Thanks to trees, cities are also equipping themselves with carbon sinks and offering local stakeholders the opportunity to offset their CO<sub>2</sub> emissions. For example, in the city of Austin or King County, the County where Seattle is located, private businesses are generating funds for the protection and planting of trees in the city in exchange for carbon credits offsetting their CO<sub>2</sub> emissions.

Finally, while summer 2018 was marked by a heatwave worldwide, combating the extension and intensification of heat islands is a must for large cities. This summer Paris tested three "islands of freshness" platforms, connected to its district cooling system. Based on the Stuttgart model, the aerated streets of new eco-cities such as Yennenga in Burkina Faso or Zenata in Morocco are designed to make use of wind movements. And, having finalised the first "ventilation corridor" in late 2017, Beijing is planning the creation of a further 17 as a solution to air pollution in the Chinese capital.





# URBAN PLANNING

## AROUND THE WORLD IN 80 INITIATIVES

### FRANCE

#### ***the Lyon-Confluence sustainable district***

The Lyon-Confluence urban project aims to double the size of central Lyon without increasing its GHG emissions. Several international partnerships (Europe, Japan) are making this district a testing ground for the sustainable development of the Metropole de Lyon. The first phase was completed in July 2018 with 500,000 m<sup>2</sup> of new buildings offering high environmental performance (passive and positive energy) and energy-efficient renovations confirmed for 70,000 m<sup>2</sup> of old buildings (housing, offices, public amenities). The total capacity of the photovoltaic installations in the neighbourhood exceeds 2 MW. Thanks to the development of the Lyon-Confluence smart grid, the Métropole de Lyon has a neat tool for monitoring energy performance.

<https://www.smarter-together.eu/fr/cities/lyon#/>

### CHINA

#### ***The world's first forest city being built in Liuzhou***

In June 2017, "forest city" work started on the outskirts of Liuzhou in southern China. This project, presented at COP21 in 2015, is the result of a partnership between the City Council's planning department and the famous architect Stefano Boeri. The city will have a surface area of 138 ha and will have 30,000 inhabitants. Inspired by the two Bosco Verticale tower blocks in Milan, also designed by Boeri, all the Liuzhou Forest City buildings will be covered with more than 100 different plant species. The project, which will be completed by 2020, will absorb more than 10,000 tonnes of CO<sub>2</sub> and produce 900 tonnes of oxygen each year.

<http://english.liuzhou.gov.cn/>

### SPAIN

#### ***Durango's innovative urban planning tool***

To support its urban transformation objective, Durango has acquired the "Faktore Berdea" planning tool which identifies different types of public spaces to ensure that there are sufficient shaded areas and permeable surfaces to avoid heat islands and flooding. The city has committed itself to a major urban transformation thanks to this tool: 26 green public spaces and 22 spaces near water have been identified for connection in a "green mesh" (malla verde). A signatory to the Covenant of Mayors since 2015, Durango has been nominated for the Transformative Action Awards 2018, whose results are to be announced in November 2018.

<http://www.sustainablecities.eu/>

### MOROCCO

#### ***Zenata eco-city, a new sustainable city***

In 2017, the eco-city of Zenata, between Casablanca and Rabat, completed the first phase of its development. Built on sustainable development and resilience principles, the particular layout of the city facilitates natural ventilation and significant greening (-3 C in summer), with 30% of green spaces, including a central park with a surface area of 7 ha. Public lighting is entirely LED, and the city promotes public transport including the creation of an intermodal station (train, express metro, bus, taxi). The first housing estate, with a surface area of 70 ha, was delivered in July 2017 and the development and upgrading of the coastal road, currently a flood zone, is underway.

<http://www.zenataecocity.ma>



## BURKINA FASO

### ***Yennenga, the new sustainable city***

Yennenga, the name of a Burkinabé princess, is also the name of a new sustainable city being built 15 km from Ouagadougou. Built to ease demographic pressures in the capital, Ouagadougou, this new eco-city is designed in harmony with the local area and with control of climatic conditions. The buildings are being arranged to control the Harmattan, a dry and warm wind from the North and to guide the movement of the southern monsoon winds to provide cool air. A solar power plant with a capacity of 270 MW will be built to supply the city and the water consumed will come from a rainwater and dew recovery system. With a surface area of 678 ha, the city is being built for a population of 80,000 people.

[www.architecture-studio.fr](http://www.architecture-studio.fr)

## UNITED STATES

### ***Columbus, Ohio, at the forefront of modal planning***

Since 2017, Columbus, the 2015 winner of the Smart Cities Challenge organised by the US Department of Transportation and financially supported by Paul G. Allen Philanthropies, has launched the pilot phase of an ambitious smart and sustainable mobility plan. This plan is expected to make the city a futuristic modal node based on nine projects including data collection, the deployment of a fleet of electric vehicles and terminals, an open-data management system and enhanced assistance for people with disabilities and transport for pregnant mothers. In order to decarbonise its transport, the city is also planning to install 1.2 TWh of renewable energy, and save up to 480 GWh by 2030. The public deployment phase will start in April 2019.

<https://smart.columbus.gov/>

## ALBANIA

### ***Tirana inaugurates the largest pedestrian zone in the Balkans***

Since June 2017, a huge space has been reserved exclusively for pedestrians in central Tirana. Skanderbeg Square, formerly a gigantic roundabout, stretches over 10 ha surrounded by a green belt of 12 wooded gardens. This pedestrian zone has improved air quality in this smog-plagued urban area, while returning the city to its inhabitants who can go there and take part in the 90-odd events already organised since its inauguration. A place of history, this strongly symbolic project is helping to transform the way public space is designed in Albania. The initiative won the European Award for Urban Public Spaces in 2018.

<http://www.tirana.gov.al/>

## INDIA

### ***West Bengal, New Town, the green city***

On the outskirts of Calcutta, "New Town", a new city with a surface area of 28km<sup>2</sup> was recognised as a Green City by the Indian Gold Building Council in August 2018, thanks to its many facets of ecological development: cultivable plants, eco-design of buildings, waste collection by electric trucks, soft mobility, as well as several parks, including a 2km<sup>2</sup> "Eco-Park". Certified a "solar city" (10% renewable energy, LED street lighting), the city had nearly 190 sustainable construction projects in 2017. As a "Happy City", there is a special focus on the well-being of its inhabitants (events, recreation areas, safety), and the integration of gender in urban planning. It is one of the first Smart Cities of West Bengal.

<https://www.nkdamar.org>



# ENERGY PRODUCTION

AROUND THE  
WORLD IN 80  
INITIATIVES

**The price competitiveness gains of recent years - especially solar energy - combined with the rise in carbon prices, which in 2018 reached their highest level in a decade in Europe, have created favourable conditions for investment in energies with little or no CO<sub>2</sub> emissions (Guardian 2018). While renewable energies (excluding large hydropower plants) accounted for more than two thirds of net installed capacity worldwide in 2017, including 54.5% solar, they now account for 10.4% of global electricity consumption, compared to 10.1% in 2017. Worldwide, cities and communities are seizing these opportunities to transform local electricity generation.**

Local authorities are playing a key role in the decentralisation of energy production and management systems. Relocating generation closer to consumption units not only increases the energy security of isolated areas, but reduces indirect emissions linked to energy transmission. Furthermore, the decentralisation of energy systems facilitates connections between infrastructures and minimises losses and costs for the consumer. These needs benefit the global micro-network market, which has grown considerably in recent years (GOGLA 2018). By acquiring a hybrid micro-grid, the remote mining town of Coober Pedy in Australia has managed to drastically reduce its dependence on fossil fuels. Such projects, which are inexpensive and easy to install, are on the rise in Africa, taking advantage of significant solar potential. Some cities exposed to conflict or natural disasters are also opting for off-grid installations based on renewable energies to increase their resilience. For example, Higashi Matsushima, Japan, which was affected by the 2011 tsunami, now produces 25% of its own electricity locally (Japan Times 2017), while in the Philippines, which regularly faces storms and typhoons, the Village of Paluan has the largest solar mini-grid in Southeast Asia.

Furthermore, the development of new technologies to enhance the value of municipal resources provides communities with new levers for locating sources of electricity. In particular, biogas produced by anaerobic digestion has long provided an alternative to waste incineration, and can be recovered for electricity or heat. In Portugal, for example, Vila Nova de Gaia is currently hitting its 2020 emission reduction targets particularly through broad coverage of its energy needs using biogas produced from household waste.

In parallel with the use of energy micro-grids, cities with district heating and cooling networks, especially in the northern hemisphere, are experimenting with a wide range of alternatives to fossil fuels. Scandinavian cities such as Helsinki and Copenhagen, which recover wastewater or waste for heat production, have long been in the vanguard of such initiatives. But other cities are also innovating; again in Finland, Ristiina has launched a hybrid thermal grid combining biomass and solar. In search of waste energy that can be harnessed to power its heat networks, Stockholm is now using the heat produced by the cooling circuits of the city's huge data centres on an unprecedented scale (BBC 2017).







# ENERGY PRODUCTION

AROUND THE  
WORLD IN 80  
INITIATIVES

## TURKEY

### ***Istanbul, a turbine produces energy from traffic***

Turning Istanbul's highways into a renewable energy source – this is the ambition of Deveci Tech, a start-up which has set up the first vertical-axis wind turbines along the BRT Metrobüs route. Installed along the roadside, the propellers are moved by the air currents produced by the passing vehicles and power a turbine. The turbines boast an electricity generation capacity of 1kW per hour and are fitted with sensors to measure the temperature, humidity and pollution of the city. This information is transmitted to an intelligent platform. The first wind turbines are in the testing phase and the project plans to install a total of 300 on this highway. In August 2018, these wind turbines, named "Enlil", won the Climate Launch Pad Award for Turkey.

<http://devecitech.com/>

## FINLAND

### ***A hybrid thermal grid in Ristiina***

In spring 2017, a hybrid thermal grid was created in Ristiina, in the Mikkeli conurbation. It combines wood chip combustion with 8% solar generation in summer, within a single plant. A storage tank containing 3,000 litres of thermal fluid acts as a heat accumulator, for use during peak consumption, and keeps prices competitive by limiting demand pressure. The transition to this low-carbon energy source has led to savings of 290,000 litres of fuel per year for homes and municipal buildings formerly powered by oil or electricity. The initiative received the 2017 "Innovative Solution" award at the Celsius City Awards.

<http://celsiuscity.eu/celsius-awards-2017/>

## FRANCE

### ***In Capelle-la-Grande, green hydrogen is being injected into the natural gas grid***

This is a first in France: "Power-to-gas", a technology that is used to recover renewable energies by injecting them into existing gas grids, has been implemented in Capelle-la-Grande, a commune close to Dunkirk. Hydrogen can be used to supplement intermittent renewable energy sources. It is used to store energy, especially when it is surplus, and to recover it by injecting it into the natural gas grid, at a proportion of 6% to 20%. This project, coordinated by Engie, involves a two-year evaluation of the proper operation and suitability of the use of this innovative technology. A hundred dwellings and a health centre are benefiting from this technology, and it is planned to adapt a bus station to this mixture.

<https://www.engie.com/innovation-transition-energetique/pilotage-digital-ef-ficacite-energetique/power-to-gas/projet-demonstration-grhyd/>

## INDIA

### ***State of Chhattisgarh: 900 electrified centres thanks to solar panels***

In India, where nearly half of all health centres are without electricity, the state of Chhattisgarh is an exception. CREDA, the renewable energy development agency in Chhattisgarh, has managed to electrify 90% of the health centres, developing a cumulative capacity of 3 MW. The installation of solar panels, combined with the energy efficiency of the fittings (LED lamps, vaccine refrigerators, microscopes) is enabling 900 centres to operate 24 hours a day, while ensuring better quality of care for the 80,000 daily patients. As an example of Good Practice, the programme was awarded the Ashden Award for "Sustainable Energy and Health" in 2018.

<https://www.ashden.org/winners/>

**CHINE*****Chongqing/Yunnan/Sichuan/Guizhou, group their hydroelectric plants***

In Southwest China, grouped together on one of the last undammed rivers, 95 small-scale "run-of-the-river" hydropower plants (0.1 to 14 MW) are producing 769,396 MWh/ year. This initiative secures energy 24 hours a day in this remote region and thus controls erosion and deforestation by limiting the use of firewood, while reducing emissions (5.9 million tonnes of CO<sub>2</sub> saved between 2009 and 2018). The grouping of the individual developments enabled access to carbon finance, with revenues allocated to training courses (plant maintenance, fruit tree cultivation) and educational programmes.

[www.southpole.com](http://www.southpole.com)

**PORTUGAL*****Vila Nova de Gaia produces one third of its power locally***

In 2017, 28,585 MW of electricity was generated by the medium-sized city of Vila Nova de Gaia (312,000 inhabitants) in northern Portugal. The recovery of the biogas produced by the city's waste enables it to cover 33% of its energy needs. A single generator was installed at the start of the project in 2004 and the plant now has seven, producing 1 MW each. A heat recovery system also heats buildings near the plant. In 2017, 13,758 tonnes of CO<sub>2</sub> emissions were avoided. A signatory to the Covenant of Mayors since 2008, Vila Nova de Gaia is on track to fulfil its commitment to reduce its GHG emissions by 20% by 2020.

<https://www.renewables-networking.eu>

**BELGIUM*****A Belgian solar energy investment cooperative in Mouscron***

Under the impetus of the Mouscron district council and thanks to the involvement of its citizens, COOPEM, a citizen energy cooperative, is a first in Belgium. With 55% citizen ownership, plus the city council (15%) and two partner companies (30%), COOPEM has led to reduced prices and technical support for the installation of solar equipment. The cooperative is also assisting the companies it supports by offering them "lease" finance. At the end of 2018, COOPEM had 90 installations in Mouscron, a signatory to the Covenant of Mayors since 2012 and a member of Energy Cities since 2013.

<http://www.energy-cities.eu>

**AUSTRALIA*****70% renewable energy for the Coober Pedy hybrid micro-grid***

Due to its remote location, this mining town in South Australia has long relied on diesel to produce its electricity independently. As of 1 July, 2017, the Coober Pedy Hybrid Power Project has been combining the generation of 4MW of wind, 1MW of solar and a 500kWh battery with the existing grid, thus significantly reducing diesel consumption. Since October 2017 the grid has operated entirely on clean energy 50% of the time. This hybrid system, an innovative solution for the electrification of an off-grid community, aims to reduce diesel consumption by 70% over its 20-year project life-cycle.

<http://www.cooberpedy.com/renewable-hybrid-project/>



# WASTE & CIRCULAR ECONOMY

AROUND THE  
WORLD IN 80  
INITIATIVES

**In 2016, more than 2 billion tonnes of solid waste were produced by cities around the world, a figure that could grow by 70% with the effects of urbanisation and the growth of the middle classes by 2050. Waste in all of its forms, from its production to its degradation, is a major source of emissions, especially methane. If waste is taken as a whole - e.g. including categories such as wastewater - together with its processing, the energy used for collection, treatment, destruction and recovery accounts for 3 - 5% of GHG emissions worldwide. Waste is more often than not the responsibility of local authorities and with their citizens are often proactive in transforming lifecycles and treatment towards circular models, with waste issues often being a gateway to environmental awareness.**

Last year was marked by global growth in restrictions on plastics, recently identified by the University of Hawaii as emitting ethylene and methane (UNEP 2018). Different strategies are underway. In India, the state of Mahārāshtra is still struggling to implement one of the largest single-use plastic bans in the world, while other approaches - such as the Chicago plastic bag tax - have been met with real success. The shared objective is to combat upstream waste generation, through restrictive or incentive mechanisms, by targeting particular materials or certain objects whose use is widespread but avoidable. Another example is the Freiburg cafés required by the council to replace disposable cups with eco-cups (deposit) that consumers can keep or bring back. The multiplication and success of eco-citizen operations, such as beach cleaning initiatives - the largest in the world ended in Mumbai in September 2018 - or the rise of "plogging" - picking up litter while jogging - also contribute to awareness raising and reinforce the social bond around an issue of protecting public assets.

Far from being a burden to municipalities, recovered waste is a valuable resource to help communities meet their needs. The first waste-to-energy station in Africa, which collects the heat emitted during incineration to produce energy, was inaugurated in summer 2018 in Addis Ababa. The development of methanisation has made it possible to produce biogas through the anaerobic digestion of organic waste and supply homes with energy. The village of Houègbo in Benin has taken up this technological opportunity

to encourage citizens to collect their waste at the same time. Such measures improve the integration of the local agricultural and industrial eco-systems with urban activities. In this way, in Santiago, the circular treatment of wastewater and sewage sludge by three "biofactories", launched in 2017, produces energy for factories, construction material and irrigation water for farming.

A significant proportion of emissions related to waste treatment originates from the pollution generated by chartered waste collection trucks. This is why cities are increasingly deciding to green their fleets - for example Melbourne, where waste trucks have been running on hydrogen since 2017, or even finding automated alternatives. Although still expensive, automated pneumatic waste collection systems, invented in Sweden in the 1960s, would reduce the number of waste trucks by 90% and are attracting more and more cities, such as Bergen in Norway which opened the largest installation of this type in the world at the end of 2016.





# WASTE & CIRCULAR ECONOMY

AROUND THE  
WORLD IN 80  
INITIATIVES

## GUATEMALA

### ***San Pedro La Laguna, the zero plastic Mayan city***

In 2017, 80% of the 14,000 inhabitants of this Mayan city banned plastic from their daily lives. Since 2016, a city council law passed by a majority has outlawed the use of plastics and punishes traders who offer them with a fine of about \$2,000. This initiative aims to preserve Lake Atitlán, and has encouraged a return to ancestral and sustainable practices: use of cloth napkins, woven baskets or banana leaves. The city has also set up its own recycling system. The city is determined in its commitment towards the sustainable transition and is also planning to include environmental courses at school and review its wastewater treatment system.

[www.unenvironment.org](http://www.unenvironment.org)

## GERMANY

### ***Freiburg, the success of reusable and returnable cups***

In 2018, more than 60% of Freiburg's cafés are using the "Freiburg Cup", a reusable cup which limits the waste associated with disposable cups (2.8 billion discarded per year in Germany). Initiated by the city in November 2016, customers of participating cafés can choose to be served in reusable cups for a deposit of EUR 1, repaid to them when the cup is returned to one of the cafes in the scheme. Today, the large number of participating businesses is a sign of the success of the initiative and makes the process easier for customers. 26,000 cups have been provided and they can be used up to 400 times. A world first when it was launched, the initiative has already been replicated in Munich and Sydney (Australia) in August 2018.

[www.zerowasteurope.eu](http://www.zerowasteurope.eu)

## ETHIOPIA

### ***Addis Ababa, the first waste-to-energy station in Africa***

Inaugurated in August 2018 following four years of work, this waste-to-energy and electricity generation plant will supply 25% of its energy to the Ethiopian capital, sustainably burning 1,400 tonnes of waste a day. This is the first waste-to-energy station on this scale in Africa and it will respond to the worrying problem of waste in this city of 4 million inhabitants with rampant population growth. Until this station, Addis Ababa had only one open dump, Koshe, where more than 110 people died during a landslide in 2017. The project, in partnership with the Ethiopian government and an international consortium of engineers, involved an estimated investment of USD 118 million.

<https://www.africawte.com/>

## BENIN

### ***In the village of Houègbo, waste against biogas***

Since its opening in late 2017, the Houègbo village waste management centre has been receiving household organic waste for conversion to biogas under a contract with residents for daily delivery. In return, they receive money, a credit, or a bag of provisions. With the support of the Swiss ReBin Foundation, this 1.3 ha centre has converted 6 tonnes of waste into 200 m<sup>3</sup> of biogas every week. It plans to produce 400 tonnes of organic fertiliser and duplicate the project in 77 municipalities. Following prospecting for the installation of a centre in Ghana and Togo, the village was chosen due to the particular enthusiasm of the inhabitants.

[www.sciencesetavenir.fr](http://www.sciencesetavenir.fr)



## FRANCE

### ***Besançon, compost in the city, it's possible***

In 2017, 743 tonnes of biowaste were composted in Besançon, by individuals and local authority facilities. Due to the limited space available to families in urban areas, public composting sites have been installed (312 outside buildings and 11 composting cabins in 2017). More than 70% of the population is served by this decentralised composting system. These good results are the outcome of the revision of the entire waste policy of Besançon by its mixed syndicate SYBERT, to move away from incineration and reduce waste. In total this has resulted in a 30% decrease in residual household waste.

[www.zerowaste.eu](http://www.zerowaste.eu)

## INDIA

### ***Chennai, the municipalities of Tambaram and Anakaputhur team up with a cement plant to recover plastic waste***

In order to limit the amount of plastic sent to landfill, in July 2018 a plastic waste recovery agreement was signed between these two municipalities in the south of the city of Chennai and the TANCEM cement plant. The municipalities meet the costs of sending plastic waste, sorted by residents, to the cement plant every week. Incentives to reduce the use of plastic are also being developed, and residents are being asked sort organic waste: families are encouraged to adopt vermi-composting, and larger organisations to install biogas equipment. Currently, about eight tonnes of plastic waste are sent to the cement plant every week.

[Tancem.com](http://Tancem.com)

## JORDAN

### ***Karak, first steps towards the circular economy***

Prior to the implementation of this initiative, every day the city of Karak sent more than 120 tonnes of waste to a landfill 35 km from the city, with a very low, only informal sorting rate. With the establishment of a cardboard and paper recycling and reuse centre, the city is now saving 730 tonnes of waste per year and two waste truck journeys per day. The council has also invited residents to sort paper, cardboard and plastic through waste awareness campaigns.

[www.connective-cities.net](http://www.connective-cities.net)

## CHILE

### ***In Santiago, water treatment based on a circular economy model***

In Santiago de Chile, all wastewater is treated by three bioplants, launched in 2017. The plants operate on circular economy principles and are managed by the Aguas Andinas company, in partnership with Suez. They transform sewage sludge into energy for their own operation and for the grid (49 GWh of electricity, 177 GWh of natural gas, 84 GWh of thermal energy) and convert 137,000 tonnes of solid waste into fertiliser for farmers.

In 2005 only 3.6% of wastewater was treated, while the rest was discharged freely into the Mapocho River. By contrast, 300,000 tonnes of sewage sludge are now treated, which is enabling the recovery of the biodiversity of this water course. The facilities won the UN Climate Action Award 2018.

<https://unfccc.int>





## BUILDINGS

### AROUND THE WORLD IN 80 INITIATIVES

**By signing the Net-Zero Carbon Building Declaration, in August 2018, 19 of the C40 cities committed to ensuring that any new buildings will be carbon neutral by 2030. Many practices already tested by cities around the world can inspire decision-makers to achieve these goals. The potential for reducing emissions is enormous - buildings today account for 50% of a city's emissions, and up to 70% for cities such as London, Los Angeles or Paris. As the world's population becomes more urbanised, city inhabitants are spending more and more time inside buildings, the smallest unit of life and activity and the focal point of any urban energy system (WRI 2018). Cities have the action and planning levers, under state regulatory frameworks, to bring about convergence in the efforts of the sector around two priorities: renovation and improvement of the energy performance of existing buildings and ensuring that new buildings are carbon neutral.**

First, it is essential for cities to develop their knowledge of the energy efficiency potential of their areas by equipping themselves with powerful information tools. This can be achieved, as in the Changning district of Shanghai (WRI 2017), by setting up a data collection platform on the energy efficiency of buildings or by mobilising sector stakeholders. Bringing together architects, residents, energy suppliers... and creating synergies to improve the energy efficiency of buildings: this is what both Tampere and Sydney did in 2017, thanks to stakeholder consultation (cooperatives, platforms, etc.) (Energy Cities 2017).

By proposing ambitious programmes built into local and national climate plans, Canadian cities are at the forefront of the future of construction. Last year Toronto adopted an action framework for planning the lower thermal energy intensity and emissions of buildings. The city has also re-evaluated its eco-construction standards to bring them into line with its long-term objectives, to ensure that each new building has a neutral or positive carbon footprint, by producing at least as much energy as it consumes. In Vancouver, energy-efficient designs, such as passive constructions, are now facilitated by incentives, practical toolboxes and the city council's vote on reforming the urban planning code that came into effect last year.

However, commitments for future constructions will not, on their own, be sufficient to ensure the decarbonisation of urban buildings. The greatest challenge remains the energy renovation

of old buildings. In order to help city residents and businesses overcome financial obstacles to the renovation of old post-war buildings, this year Belgrade launched a Fund for Energy Efficiency, drawing inspiration from the Riga model (Balkan Green Energy News 2017). Beginning this year with the Renew Boston Trust, a major programme to renovate public, commercial and multi-family housing, Boston is also looking to direct private real estate investment flows for more renovation and energy efficiency projects. In addition to the financial element, technical support programmes for private individuals are being implemented, such as the *Rénov'Énergie* device in Montpellier.

In addition to providing the regulatory framework and channelling funding, many technological innovations offer simple solutions for adaptation to urban warming and mitigating building emissions. "Cool roofs", for example, reflect the sun's rays, thus keeping the interior of buildings cool and limiting the use of automated ventilation systems. For example, in India, where the population density and air pollution exacerbate the effects of heatwaves, Ahmedabad and Hyderabad introduced programmes to install cool roofs in residential buildings in 2017 and 2018.







### MAURITANIA

#### ***Village of Diakré - First village entirely built in a Nubian vault***

Since 2017, the village of Diakré has become the first Mauritanian village built as "Nubian vaults". This architectural technique mainly uses locally available raw earth, with no wood, thus reducing deforestation. Adapted to Sahelian populations, it also offers robust resistance to bad weather. Located on the banks of the Senegal River, this village consists of 51 private houses, a mosque, a literacy room and a maternity ward. The 54 projects over three years have enabled the employment and training of 61 apprentices. The Voûte Nubienne association, which operates in five West African countries, has saved 75,000 Tq CO<sub>2</sub> since the start of the programme in 2000.

[www.lavoutenubienne.org](http://www.lavoutenubienne.org)

### INDIA

#### ***3,000 cool roofs in Ahmedabad***

In May 2017, as part of its heatwave action plan, the municipality of Ahmedabad converted 3,000 roofs into cool roofs in six poor neighbourhoods. This technique, which involves painting the roofs with a clear and reflective coating (a very economical lime mixture), lowers the interior temperatures by 3 to 5°C in this arid zone where temperatures can reach 42°C. The mayor of the city inaugurated the initiative himself, supported by a commitment from the private sector to provide the painting for free and 50 student volunteers. In 2018, 20 to 25 construction agencies committed to offer cool roofs for private buildings with the support of the city council, which is also beginning the transformation of municipal buildings.

[www.nrdc.org](http://www.nrdc.org)

### NORWAY

#### ***Drøbak, 1st "Powerhouse" standard school***

A "Powerhouse" is a positive energy building, producing more energy than the total amount consumed during its life cycle. This standard was established by a coalition of Norwegian building companies (development company, architectural firm, consulting firm, etc.). In February 2018, it was used in the construction of the first "powerhouse" school, producing 30,500kWh/year. The coalition also worked on the world's first positive-energy building renovation, Kjørbo, reducing its energy demand by 90%. The coalition is now developing internationally, with the "Harvard Housezero" project: the renovation of a university building into a Powerhouse.

[Powerhouse.no](http://Powerhouse.no)

### BELGIUM

#### ***In Mons, Project 55, "zero energy" heritage renovation***

Certified a passive building in 2017, Project 55 is the renovation of a heritage registered mansion under the "zero energy" standard: eco-materials, sustainable water management, PV panels, aquaponics etc. As the first renovated tertiary building of this type in Belgium, it proves that it is possible to renovate a building to demanding environmental standards, using simple techniques, to make this renovation easily reproducible. Project 55 won the Sustainable Renovation Grand Prix at COP23.

<https://www.construction21.org>



## FINLAND

### ***Tampere - Tampere Plus (TARMO +) Low Carbon Housing***

The TARMO + project, funded by ERDF and managed by the Tampere Energy Agency, supports low-carbon and low-consumption solutions for 250 cooperative residential housing units over a three-year period (2015-2018). In particular, it has provided for the training of a designated "Energy Expert", a resident in each cooperative housing unit, and promotes stakeholder collaboration (housing companies, energy suppliers, residents) through events (27 in 2017), workshops (five in 2017) and highlighting good practices on a project-dedicated platform. This project, labelled "URBACT Good Practice" in 2017, supports climate strategies implemented at the local, national and European level (Blueprint 2020).

<http://urbact.eu>

## SPAIN

### ***Madrid. Plan Madrid Recupera***

Since June 2016, the Madrid Recupera Plan ("Mad-Re") has allocated an accumulated budget of nearly EUR 75 million to the regeneration of residential buildings in inner-city and suburban districts vulnerable to climate change. As a priority of the elected municipal council in 2015, the programme, which ended on 21 October 2018, co-financed, to a maximum of 60% and EUR 8000, work by individuals to improve accessibility and energy efficiency and renovate and remove asbestos from buildings. Selected based on social, economic and environmental criteria, more than 590,000 precarious, old or non-standard dwellings, covering nearly 43% of the population, were eligible for the programme in 2017.

<https://planmadre.madrid.es/>

## AUSTRALIA

### ***Sydney, better building partnership***

Steered by the city council, the Better Building Partnership brings together homeowners, industrialists and any stakeholder involved in the performance and sustainability of existing offices and commercial spaces in Sydney. Covering more than half of the city's commercial spaces, the BBP has led to an increase in the performance of buildings: renewable energies, insulation as well as waste and wastewater reduction, resulting in a 52% reduction in emissions and 43% reduction in energy consumption compared to 2006. In 2017, the emission of 1.1 million tCO<sub>2</sub>eq was avoided and the BBP is on track for zero emissions. In June 2018, based on this multi-stakeholder collaboration model, the city launched the Sustainable Destination Partnership, bringing together tourism development stakeholders.

[www.betterbuildingspartnership.com.au](http://www.betterbuildingspartnership.com.au)

## CHINA

### ***Shanghai, Changning District. Big data at the service of the energy performance of buildings***

Participating in the China Better Building Challenge and the C40 China Buildings Programme, the Changning District - 700,000 residents at the heart of Shanghai's business centre - promotes the energy efficiency of its public buildings. An energy consumption data collection and monitoring platform tracks the energy performance of 160 of its 165 public buildings and has led to the renovation of 32 buildings, with an average energy saving of 20%. Furthermore, in mid-2017 the district council allocated a grant in excess of USD 3 million to energy renovation, providing a leverage effect in the private sector which invested USD 20 million in the improved energy efficiency of buildings.

[www.wri.org](http://www.wri.org)



# FORESTS

## AROUND THE WORLD IN 80 INITIATIVES

**Given the urgency of climate change and the extent of the degradation of eco-systems and forest areas, which sequester about 2 billion tCO<sub>2</sub>/ year (FAO 2018), which play a key role in climate stabilisation scenarios, especially in the most recent IPCC report on the possibilities of limiting global warming to 1.5°C. However, at the same time, anthropogenic deforestation and its multiple causes are reducing forest cover and generating emissions. The solutions being researched range from the fight against illegal logging and the uncontrolled expansion of agricultural land to afforestation and the conservation of canopy covers in urban and rural environments. While states have multiplied their international commitments in recent years (New York Declaration, Bonn Challenge, etc.), at GCAS 2018, 45 major cities created a new action coalition - Cities4Forests – for the conservation and restoration of forests both near and far from urban centres. Major projects have been associated or driven by local and regional governments and local communities in recent years.**

Tropical forests are the most affected by deforestation, with the disappearance of 15.8 million hectares in 2017, the second largest year of loss of forest cover (Global Forest Watch 2018). At the international level, reforestation initiatives in fragile areas are the focus of a concentration of political and financial resources. For example, the Indian state of Madhya Pradesh has set the record of mobilising 1.5 million volunteers to plant 66 million trees in 12 hours. In Pakistan, the region of the new President Imran Khan also managed to restore 350,000 ha of forests between 2014 and 2017. Relying on local communities, the devolution of management powers and the recognition of the rights of indigenous peoples are therefore regularly cited as a major challenge for the implementation of forest management consistent with the Sustainable Development Goals. While the institutionalisation of these governance rights remains very rare, initiatives are moving in this direction with the support of international NGOs. For example, the ICCO and the WWF, respectively, have enabled the Mayangna people's government of Nicaragua and the fishing communities of Manambolo in Madagascar to develop tools for managing their forest resources in a decentralising environment. In the latter case in particular, the focus is on mangroves which, like peat bogs, are ecosystems that are highly fragile while rich in biodiversity and with a very high carbon absorption capacity.

Cities are increasingly involving themselves in forest health, especially to stabilise water resources as their quality depends on the condition of the soil and vegetation of drainage basins, but also with the aim of reducing air and local pollution. For example, in Alicante, the development of urban forests is now part of city planning strategies as urbanisation advances (see theme 1). Mexico is developing its forest space mapping tools with Global Forest Watch, while in Indonesia in 2019 the Papua region will benefit from an atlas of deforestation and industrial plantations similar to the one developed this year by CIFOR in Borneo.





# FORESTS

## AROUND THE WORLD IN 80 INITIATIVES

### PAKISTAN

#### ***Khyber Pakhtunkhwa province, the "billion tree tsunami"***

In August 2017, the "billion tree tsunami", a massive reforestation project in the mountainous province of Khyber Pakhtunkhwa, passed its goal of one billion trees. The project, initiated in 2014 by the governor of the province, former sportsman Imran Khan, with investment of USD 169 million, has enabled (through natural regeneration or planting) the restoration of 350,000 ha of forest. The opening of 13,000 private nurseries has also created thousands of jobs. The province's commitment in March to develop an additional 252,000 hectares was the first sub-state commitment to the "Bonn Challenge". The major impact of this success also triggered a national reforestation campaign: "Plant for Pakistan".

[www.weforum.org](http://www.weforum.org)

### SOUTH AFRICA

#### ***Ethekwini, reforestation around the Buffelsdraai landfill***

Between 2008 and 2017, this community-based reforestation project enabled the city to plant 709,124 trees of 72 different species around the Buffelsdraai landfill. As an adaptation and mitigation initiative, it creates a "buffer zone" around the landfill to limit the risk of fires while protecting biodiversity and offsetting the carbon impact of the city. Its community-based approach has led to the creation of more than 500 jobs, including treepreneurs (tree entrepreneurs) - who sell seedlings for the project. In the long term, more than 42,000 tonnes of CO<sub>2</sub> will be sequestered over 20 years. Inspired by this success, the city has already developed two other similar projects.

<http://www.durban.gov.za>

### SPAIN

#### ***Alicante, replenishing the forest of Mont Benacantil***

This project, initiated by the city's Department of the Environment, aims to regenerate the forests of Mont Benacantil by repopulating it with pines of different ages, to recreate the natural condition of the forest. Cartagena cypress and tetraclinis conifers have been selected for their adaptation to the environment. Two viewing points have also been created and trails have been refurbished for easy access. The runoff areas have also been controlled by the construction of small stone walls. Phase I of the project was completed in 2017.

<https://naturvation.eu/nbs/alicantealacant/benacantil-vegetation-restoration-project>

### KENYA

#### ***Gazi Bay - "Mikoko Pamoja", restoring mangroves using carbon credits***

In Gazi Bay, two villages (Gazi and Makongeni) have joined forces for the preservation of the mangrove swamp by exchanging nearly 3,000 CO<sub>2</sub> teq of carbon credits. The first community initiative of its type, the profits so far have made it possible to preserve 117 ha of mangroves. This system also ensures regular revenues used to provide access to water for 3,500 inhabitants or to buy school supplies for 700 school children. In 2017 this project received the "Equator Initiative" award, and is being replicated in other regions in Kenya.

[www.equatorinitiative.org](http://www.equatorinitiative.org)



## MADAGASCAR

### ***In Manambolo Tsiribihina, local communities are restoring mangroves***

Between 2015 and 2018, under the leadership of WWF, local communities in the Menabe and Malaky regions conducted a vast mangrove restoration campaign in the Manambolo Tsiribihina delta. A total of 150 ha was restored and more than 930,000 mangrove propagules were planted by youth and fishermen's community associations who depend on this rich and fragile eco-system that prevents coastal erosion and absorbs a lot of carbon. To anchor the protection of mangroves as locally as possible, the WWF is also encouraging the management of 8,000 ha of mangroves by Base Committees (COBA), empowered to manage natural resources through a transfer of state powers. A new phase of the project was opened in 2018.

<https://www.wwf.fr>

## MEXICO

### ***In Mexico, open data used to monitor protected forests***

Mexico City's Environment and Land Management Agency (PAOT) has formed a partnership with Global Forest Watch, an open-data geo-spatial forest observation platform, to improve control and monitoring of forest cover losses. This partnership is providing Mexico with a precise and inexpensive mapping tool enabling it to control the 87,300 ha of "Forest Conservation Area" covering 59% of the city's surface area and threatened by illegal activities. The data collected is open to the public and stakeholders and provides policy makers with measurements of change in forest cover and technical data to support local policies. This initiative was recognised by the Reforestamos Mexico GWF Contest.

[www.blog.globalforestwatch.org](http://www.blog.globalforestwatch.org)

## BRAZIL

### ***In the State of Pará, agroforestry is being developed for cocoa farming***

In the municipalities of Tucumã and São Félix do Xingu - the most deforested in the Amazon - The Nature Conservancy is facilitating The Forest Cacao Project, a multi-stakeholder partnership to promote agroforestry among smallholder cocoa farmers. Technical support is provided with a focus on women's training and two instruments have been developed to improve production systems and decision-making: a registration portal to monitor deforestation and compliance with the Brazilian Forest Code and an information platform providing indicators and analyses for farmers and technicians. In early 2018, the project reported that it had trained 117 families in total since 2012, and aims to restore 22,000 ha of land in 2022.

[www.iucn.org](http://www.iucn.org)

## INDIA

### ***Madhya Pradesh, 1.5 million volunteers plant 66 million trees in 12 hours***

This spectacular operation is a model of citizen mobilisation in order to achieve Indian commitments under the Paris Agreements. The government of Madhya Pradesh managed to mobilise more than 1.5 million volunteers on 2 July 2017 to plant 66 million saplings in 12 hours - a new world record. The diversity of species planted - more than 20 - is considered beneficial for enhancing the absorption potential of future forests.

[www.independent.co.uk](http://www.independent.co.uk)





**Food insecurity has been increasing in recent years. Malnutrition has been climbing for three years, affecting 817 million people in 2017 (FAO 2018), while 2.1 billion people lack safe access to drinking water. At the same time, obesity is increasing - not only in northern countries - and 1.6 billion tonnes/ year or one third of the world's annual food output, accounting for 8% of global GHG emissions, are wasted throughout the value chain (FAO 2018, BCG 2018). These dysfunctions call for solutions to improve autonomy and local control of production and consumption and to reduce risks for the entire global food system.**

The development of urban farming blurs the functional boundaries between urban and rural areas and accompanies the concentration of demand in cities caused by increasing urbanisation. With both manual work and technological innovations, the inhabitants of Seoul, Bogotá and Rotterdam are recovering unoccupied spaces and the verticalisation of buildings in cities to deploy small-scale agricultural initiatives. Nevertheless, the food consumption of large cities obviously remains dependent on rural communities. This is why enhancing the capacity of farmers is also a key focus of Medellín's food policy, in partnership with the FAO.

However, food security is not only a matter of stability and distribution of the volumes produced. It offers the potential for everyone to have access to healthy and nutritious diets. Many cities are beginning to roll out organic, vegetarian or light in meat kitchens (80% of GHG emissions from food), while the Indian state of Sikkim has become the world's first to convert all its farmers to the organic model. While the conversion of farmers sometimes raises difficulties, it also provides an opportunity to relaunch activity in remote areas, such as the village of Brachoua in Morocco, which is being revived thanks to permaculture.

Recent years have seen increased awareness that has spawned a multitude of initiatives in communities combating waste at different scales, for example, by penalising the waste of restaurants, as in Austin. One-off crises in critical areas can also provide opportunities for municipal services and citizens to adopt new resource-saving practices. For example, Cape Town's water shortage this year.

Finally, the impacts of climate change on food systems require that new ways be devised for the organisation and resilience of agricultural practices. This is the work undertaken in the climate-smart villages supported worldwide by the Consultative Group for International Agricultural Research (CGIAR). For example, in the village of Ma in Vietnam, a combination of local and exogenous knowledge is being deployed to take advantage of unpredictable climates and ensure local food security.







### MOROCCO

#### ***Brachoua, revival of a village through permaculture***

This village has emerged from poverty thanks to the development of permaculture. Four agricultural cooperatives were created and training in natural and organic farming techniques was delivered with the support of the Ibn-al-Baytar association. Several wells that were dug and nearly 40 vegetable gardens (compared to only one in 2013) are today providing food autonomy and a source of revenue for this village that once lacked everything: sales of products to neighbouring villages, development of eco-tourism, craft production by the women's cooperative, etc. The cooperative was chosen to exhibit its organic products at the Casablanca solidarity market, which opened in March 2017.

[www.agrimaroc.ma](http://www.agrimaroc.ma)

### VIETNAM

#### ***Smart-agriculture transforms the village of Ma in Vietnam***

In this village in northern Vietnam, farmers are practising smart agriculture to address food insecurity and climate change. With the support of the CIAT and the CGIAR, a basket of technologies and practices has been defined based on their replicability potential in the region. The farmers then chose the solutions they want to implement: intercropping cassava/vegetables, cultivation of acacia for soil fertility, vermi-compost, production of flood-resistant rice, etc. The project, with 65% of mobilised participants being women, has made it possible to test several solutions at once in order to define the most suitable practices. At the end of the tests, 16 farmers agreed to train other farmers in these techniques.

[ciat.cgiar.org](http://ciat.cgiar.org)

### KOREA

#### ***Seoul City Council supports urban agriculture***

Since 2011 and the election of Park Won-Soon as mayor, Seoul has been at the forefront of urban agriculture. In almost seven years, the number of urban farms and community gardens has increased sixfold and the city has set itself the goal of establishing 1,800 vegetable gardens in 2018, with investment of USD 46 million in the transformation of unused areas. In particular, the district of Gangdong-gu is seeking to provide every home with an urban vegetable garden by 2020, by making the most of the roofs of skyscrapers, schools, parks, etc. The district mayor is also funding courses and training to build on this momentum to revitalise and strengthen social bonds.

[www.icleikorea.org](http://www.icleikorea.org)

### INDIA

#### ***State of Sikkim, the world's first 100% organic state***

Since 2003, the State of Sikkim has been engaged in an ambitious agro-ecological transition and in 2017 managed to convert to organic production on all of its agricultural land. The small state is thus demonstrating the potential for meeting food security challenges by implementing alternatives to the intensive agriculture pursued in the Indian Green Revolution. In total, nearly 66,000 farmers have benefited from awareness-raising and training courses on organic farming practices. Simultaneously, the State has progressively banned pesticides and chemical fertilisers whose use, since 2016, can be punished with a fine of EUR 1,300 and three-months' imprisonment. Sikkim's success has been recognised with the 2018 Future Policy Award, awarded by the IFOAM, the FAO and the WFC.

[www.fao.org](http://www.fao.org)



## NETHERLANDS

### ***Rotterdam, the world's first floating farm***

In partnership with the company Beladon, the City of Rotterdam is preparing to open the world's first floating farm in Merwehaven harbour in 2018. It will house 40 dairy cows in an artificial pen, capable of producing 800 litres of milk a day. On the other two levels of the building, a workshop will produce dairy products and greenhouses will be used to produce food for the livestock. Organic waste from surrounding restaurants and cow manure will be recycled, rainwater will be collected and solar panels will feed hydrogen generation by electrolysis, to ensure the energy autonomy of the farm. The farm is storm-resistant and is a pilot project for food resilience in urban areas.

[www.futura-sciences.com](http://www.futura-sciences.com)

## SOUTH AFRICA

### ***Cape Town, a digital tool to improve the management of water networks***

Cape Town is plagued by permanent water stress, which resulted in a long water shortage in 2018. In addition to the rationing imposed on inhabitants, decreasing their daily water consumption from 600 mL in mid-2017 to 507 mL in April 2018, the city needs structural solutions to secure everyone's access to clean water. The Department of Water and Sanitation therefore formed a partnership with SAP Work Manager, a mobile platform to put agents involved in the installation, maintenance, inspection and repair of water sanitation and distribution infrastructures in contact with one another. This measure should facilitate the mobility of its agents, improve the resilience of the city and postpone "Day Zero", when the water distribution network would be brought to a halt.

<https://www.thesouthafrican.com>

## UNITED STATES

### ***Austin bans food companies from throwing food away***

As part of its zero-waste plan for 2040, Austin, Texas, passed a "Universal Recycling Ordinance" on 1 October 2018. This regulation requires all food businesses, particularly restaurants, to "divert" their organic waste from landfills, while 40% of the waste found there is organic. Austin is offering these companies sustainable options, such as donating surplus food, composting leftovers or sending them to farms to feed livestock. Furthermore, companies shall train their employees in these practices, provide informative signage on their sites and post an annual organic waste diversion plan online.

[www.austintexas.gov](http://www.austintexas.gov)

## COLOMBIA

### ***Medellín, a plan for the territorial integration of food production***

The department of Antioquia, the metropolitan area of Valle de Aburrá and the City Council of Medellín in 2017 launched an "Alliance for Good Living", a multi-level governance tool which aims to create a "City-Region Food System" under the FAO's Food for Cities programme. This system aims to strengthen social cohesion between the city and the surrounding rural municipalities and to ensure the food security of the region by promoting short distribution channels. The plan seeks to move away from Colombian productivist models towards healthier diets with a 15% increase in farmers' incomes while also reducing food prices by 15% together with a long-term plan for resilience and adaptation to climate change.

[www.fao.org](http://www.fao.org)



# TRANSPORT

## AROUND THE WORLD IN 80 INITIATIVES

**The transport sector today accounts for 23% of GHG emissions worldwide, a 68% increase since 1990 (IEA 2017). They could even triple by 2050 in OECD countries. While cities are the source of half of these emissions, territorial mobility strategies are at the heart of the challenges. Among the thousands of initiatives being developed worldwide in an area that is often under the aegis of regional governments, we can identify at least some areas of intervention, particularly in the cities of the Southern hemisphere.**

Car-free days, initiated at the end of 1956 in response to the fuel shortages caused by the Suez crisis, are now a real success in many large cities in the South, which have made them a regular occasion to raise the awareness of citizens. Kigali joined the movement in 2016 and Nairobi is announcing a similar initiative. In Bogotá, Quito and São Paulo they have been successfully implemented, while in August 2018 Jakarta launched an extended car-free day at ASEAN. Although the impact on GHG emissions is limited, car-free days help to spread new mobility practices that combine with questioning the domination of cars in cities.

The fight against air pollution is prompting more and more local elected officials to review the role of cars in city centres and to develop private and public modes of transport that produce fewer emissions. Brussels has banned diesel in the city, as has Hamburg, which relies on the support of the German Federal Administrative Court. Vehicles that are more than 20 years old are banned from the centre of Barcelona during the week, while Haifa became the first Israeli city to establish a Low Emission Zone (LEZ), and there are already 227 LEZs in 12 European countries (Ademe 2018). Changes in CO<sub>2</sub> and particulate emissions standards are also central to the debates, as in Quebec, which has undertaken an ambitious clean vehicle development programme under the ZEV standard. At the same time, the development of the supply of self-service electric vehicles is expanding the range of individual short trip mobility options for city residents. Cars, bicycles, motor scooters or scooters are encouraging new thinking on sharing public roads and travel modes in major cities. Public transport is also the target of greening: with 100% electric buses – a

world first - Shenzhen this year became the flag bearer of electric public transport.

Furthermore, investments in the development or improvement of public transport infrastructure remain a crucial issue in a context that is often difficult for local finances. In recent months, Kochi, in India, has opened its first metro, which is partly solar powered, and Abuja, the capital of Nigeria, has acquired its first two lines. Meanwhile Abidjan's metro project is pending clarification. To respond to population growth and chronic congestion problems, large cities are also developing their public roads to facilitate access and the circulation of public transport. These systems, especially the Bus Rapid Transit (BRT), are undergoing major growth in South America and Asia. A pioneer in the area in South America, Buenos Aires is continuing to extend the lines of its Metrobús, which travel on dedicated lanes. Based on the model of the city of Pune, which has received many awards, Indian cities are multiplying their BRTs and are trying to steer a paradigm shift in modes of transport. Following the example of Sydney, which has developed a signage management system adapted to bus schedules and delays to improve public transport traffic, an increasing number of cities are using smart technology and big data to regulate traffic, optimise existing networks and plan urban traffic.





# TRANSPORT

## AROUND THE WORLD IN 80 INITIATIVES

### RWANDA

#### ***Kigali, Car-free days***

Since summer 2016, two Sundays a month on the roads of Kigali are reserved for bicycles and pedestrians. This initiative, which has led to lower emissions, due to traffic decongestion, also promotes occasions dedicated to the well-being of the city's residents. The City Council has prioritised the promotion of better lifestyles by offering a range of group sports activities and by setting up booths offering free medical examinations. The initiative is very popular in Rwanda and is mobilising more and more participants and becoming an opportunity for mobilisation for the environment. For example, on 3 June 2018, a march against plastic pollution organised by the Ministry of the Environment was held during this day.

[www.kigalicity.gov.rw](http://www.kigalicity.gov.rw)

### INDONESIA

#### ***Jakarta launches its first bicycle sharing scheme***

Since July 2018, in the historic district of Monas, the city council of Jakarta has been providing its first bicycle sharing stations. A hundred bicycles, distributed over seven stations, are accessible through the "Gowes" application, which provides users with information on time and place and also the number of calories burned on their journey. All the bicycles are equipped with a security device to prevent theft, as well as a GPS system. This scheme, available free for the first three months, aims to reduce the use of cars in one of the most polluted cities in the world.

<https://gowesin.id/>

### INDIA

#### ***Kochi inaugurates its new metro***

The Kochi metro system was commissioned in June 2017. Built at height and extending for 13 km, the KMR (Kochi Metro Rail) has capacity for 975 passengers per train, significantly reducing congestion. 25% of its power is provided by solar panels located on the roofs of the 22 metro stations, with a total capacity of 4 MW. In July 2018, the KMR also inaugurated a bike sharing scheme, with stations located at the foot of the metro, to facilitate the interconnection of transport modes. A first extension of the network was agreed this summer and the metro must eventually be extended to 25 km.

<https://kochimetro.org/>

### UNITED KINGDOM

#### ***London taxis go electric***

Since January 2018, an electric version of the iconic London taxi has been operating on the streets of the city. In March 2018, the LEVC (formerly the London Taxi Company) launched a new production plant for a clean version of the "black cab", the London taxi. This change accompanies a new regulation that came into effect in London in January 2018, requiring all new taxis to be zero or low emission vehicles. The Mayor's Office is subsidising the purchase of these new models and is planning to install 150 new charging points in 2018, then 150 more by 2020. Following this success, the LEVC will begin exporting its production, to Germany in particular.

<https://tfl.gov.uk>

**CHINA*****Shenzhen, the world's first city with 100% electric buses***

Since the end of 2017, the whole of Shenzhen's bus fleet - 16,359 vehicles - has been replaced by electric buses. This is the world's first city to adopt a completely electric fleet of buses. The transition took place quickly: in 2015, the city had only 4,877. The bus model is optimal for this large city - 5 hours' charging provide nearly 250 km of travel, sufficient to cover needs for one day. This initiative has also led to a reduction in the city's emissions of 1.35 million tonnes of CO<sub>2</sub> each year. For Shenzhen the next step will be to do the same for its taxis, 63% of which are currently electric.

<https://www.wri.org>

**CANADA*****In Quebec, a standard stimulates the supply of clean vehicles***

Since 11 January, 2018, Quebec has been the first Canadian region to have implemented a ZEV (zero emission vehicles) rule. Manufacturers are required to produce a mandatory number of ZEVs for the Quebec market, through a complex system of credits calculated based on the number of these vehicles sold as a proportion of the total sales of each manufacturer. The rule therefore aims to boost the supply of clean vehicles and the development of new models. In 2018, the ZEVs will be required to reach 3.5% of sales. This rate will progressively increase to 22% of sales in 2025.

[www.mddelcc.gouv.qc.ca/  
changementsclimatiques/vze/](http://www.mddelcc.gouv.qc.ca/changementsclimatiques/vze/)

**ISRAEL*****The city of Haifa defines a low emissions zone***

Since 2 February 2018, polluting diesel vehicles weighing over 3.5 tonnes have no longer been allowed in the centre of Haifa, unless they have a special filter permitting entry to this low emission zone. Approximately 22,000 vehicles are affected by this restriction. The measure, which is the first of its kind in Israel, is only a first step: from 2019, the restriction will be extended to all diesel commercial vehicles. The initiative is part of a larger programme to reduce pollution in Haifa Bay.

<http://avirnaki.yefenof.co.il/>

**SWEDEN*****Stockholm combines last stage of delivery with waste collection***

In March 2017, the city of Stockholm launched "Älskadestad" (a well-loved city), a solution for optimising its logistics network, in partnership with three companies: Ragn-Sells (recycling), Bring (delivery) and Vasakronan (real estate). The idea is simple: while delivery vans usually arrive loaded and leave empty, and waste collection vehicles do the opposite, the scheme aims to combine these two flows. Parcels are left in a micro hub in the city centre, with the recycling company collecting them and providing the last kilometre of transportation. Route optimisation reduces traffic and improves air quality. First implemented in the city centre, in summer 2018 Älskadestad was extended to the old town and the project is being rolled out in Malmö this year.

<http://www.alskadestad.se/>





# ADAPTATION

## AROUND THE WORLD IN 80 INITIATIVES

**In response to one-off disasters or long-term ecosystem changes, local areas and communities are seeking to develop adaptation strategies to build their own capacities and the capacities of local stakeholders, in order to reduce negative impacts and/or take advantage of new climate conditions, or at least of the mobilisations thus generated. The development of these public policies is in full swing. Accordingly, in 2017, more than 200 different actions were listed by the members of RegionsAdapt to respond to 19 different risk categories. The priorities reflect the main vulnerabilities of the local areas based on their specific needs.**

In highly urbanised countries with large cities that can finance their own initiatives, efforts are concentrated on flood protection, water management, urban planning and building consolidation: technical solutions are well-known and tried and tested and therefore easier to identify and finance. For example, coastal or river cities like Shenzhen, Bratislava or the member communities of the Porous City Network in Bangkok, are multiplying green spaces to restore rainfall and flood drainage capacity, which has been impaired by the sealing of artificial surfaces in cities. In Hawaii, the federal state this year passed into law the requirement to take account of scientific knowledge on rising sea levels in any new real estate project.

Conversely, developing countries rely heavily on the rural economy and devolution tends to be weak, so institutionalisation often depends on the self-organisation of local communities. NGOs, IGOs and international donors support these local communities with technical or financial support. Adaptation strategies are based on the identification of vulnerabilities, but with real difficulties in accessing scientific data. In rural or desertified areas, the reduction of climate unpredictability cuts across small-scale development imperatives (Adenle A. et al., 2017). Thus, one of the latest projects funded by the Adaptation Fund is a project supporting small farmers in four governorates in southern Iraq, or climate-smart agriculture in Guinea-Bissau. Another major priority is empowering women in rural areas. In four provinces in Cambodia, for example, women's councils on climate change have been created, providing support and advice to municipal authorities on climate change (UNDEF 2018).

To help prevent, anticipate and coordinate emergency responses to disasters, many projects are setting up systems for disseminating knowledge and information by taking advantage of the increasing penetration rates of new technologies. To this extent, Legazpi in the Philippines uses the Balangay web alert system to warn citizens of future risks and suggest emergency measures. In partnership with the Government of Nunavut, a local university, and Inuit communities, SmartICE has developed a real-time tracking and dissemination tool for polar ice floe developments, building on local knowledge and practices (UNFCCC 2018).







# ADAPTATION

## AROUND THE WORLD IN 80 INITIATIVES

### CHINA

#### ***Shenzen, a "sponge city"***

Accelerated urbanisation in China has led to an increased risk of flooding. To adapt to this situation, 30 Chinese cities have embarked on the "Sponge City Initiative", a scheme to implement a range of techniques for the absorption of torrential rains, such as greening roofs or rainwater recovery in tanks. In partnership with The Nature Conservancy, Shenzen has been designated the pilot city of this project. The project involves creating a sustainable water circulation system to minimise the impact of climate change on the city. To date about 10% of the roofs of the city have been greened. With 50% of buildings covered, 70% of the water could be absorbed and the city air purified. The Fenghang District was ranked first among the 14 pilot areas nationwide this year.

[www.nature.org](http://www.nature.org)

### SLOVAKIA

#### ***Bratislava for sustainable management of rainwater in urban areas***

"The city of Bratislava is preparing for climate change", this project, which ran from 2014 to 2017, sought to increase the resilience of the city to heatwaves and extreme rainfall by creating green spaces and using permeable surfaces. In 2017, the eight pilot projects were being finalised: 1 ha of paving replaced by green spaces in Petržalka district square, 1,000 m<sup>2</sup> of vegetation on the roof of a council-run retirement home, runoff water biological management systems, two revitalised water reservoirs. The project also provides an envelope of EUR 50,000 to support sustainable drainage projects. In April 2017, the city also adopted its Adaptation Action Plan.

[www.climate-adapt.eea.europa.eu](http://www.climate-adapt.eea.europa.eu)

### VIETNAM

#### ***In the Mekong Delta, amphibious homes against floods***

To combat the devastating floods in the Mekong Delta region, the Buoyant Foundation Project is renovating traditional Mekong homes to adapt them to floods. This model, which has already been tested in Louisiana (USA) following the 2005 floods, involves transforming the foundations by integrating floating elements to enable the structure to rise with the rising waters. The renovations are carried out in partnership with masons who are trained in these new techniques. Since 2017, an 18-month project has been underway to reproduce this project at Lang Sen, with financial support from the Global Resilience Partnership.

<http://buoyantfoundation.org>

### SENEGAL

#### ***65 adaptation projects in the Kaffrine region***

In three years, the Decentralisation of Climate Funds project has financed more than 65 adaptation projects in the Kaffrine region of Senegal. Implemented by IED Africa, this project, whose experimental phase ended in 2017, revolves around a decentralised planning and financing mechanism to strengthen the resilience of vulnerable populations, who have been able to take ownership of local projects. 36 local authorities and 300,000 people have benefited from the 900 million FCFA granted for adaptation projects in agriculture, education, livestock, and so on. This scheme leads to better coordination between national and local planning systems and supports the empowerment of communities who choose their own solutions.

[www.iedafrique.org](http://www.iedafrique.org)

**PERU*****Canchayllo and Miraflores restore ancestral water management systems***

For several years climate change weakens the ecosystem of the mountainous area of Puna, and the drought threatens the Andean pastoralism. In order to preserve their way of life, two indigenous communities of the villages of Canchayllo and Miraflores have restored 3000-years-old ancestral systems of water management. By rehabilitating this irrigation system and by capturing the waters in canals and tanks through a mix of modern and ancient infrastructure, the flow of waters is limited and the meadows rekindled. Completed in 2016 with the support of the Mountain Institute, this project received in 2018 the St Andrews Prize for the Environment.

[www.mountain.org](http://www.mountain.org)

**UNITED STATES*****Hawaii forces the real estate sector to consider rising water levels***

On 4 June, 2018, Hawaii Governor David Ige enacted three new climate change laws. One of them now explicitly requires developers of new real estate projects to take account, in their future environmental impact studies, of the "best available scientific knowledge at the time" on rising sea levels. The Environmental Quality Control Board of the State of Hawaii is tasked with publishing the technical terms for making these estimates in the coming months. Long affected by the erosion of its coasts, this law puts the island at the forefront of the integration of scientific knowledge in urban planning policies.

<https://nextcity.org/daily/entry/hawaii-gets-explicit-about-sea-level-rise>

<https://capitol.hawaii.org>

**IRAQ*****Reviving peasant agriculture to address water stress and soil salinisation***

In the governorates of Al-Muthanna, Al-Qadisiyya, Maysan and Dhi Qar, where poverty rates are among the highest in Iraq, in March 2018 the Adaptation Fund approved a \$10 million, 6-year investment for a Peasant Agriculture Revival Project supported by the IFAD. In partnership with the national government, the project contributes to the development of skills and local capacity building in agricultural planning in order to improve the management of water resources and irrigation, which are directly impacted by climate change and soil salinisation. Around 15,795 farming and livestock-dependent households, some displaced or having abandoned their activity, could benefit directly from these investments.

<https://www.adaptation-fund.org>

**PHILIPPINES*****Legazpi, a web-based information platform to respond to disasters***

Balangay, a real-time disaster information and collaboration platform, is helping to reduce the vulnerability of people in this area who are increasingly exposed to climate risks. Developed by the Layertech web agency and implemented in the city of Legazpi, this web and mobile application facilitates collaboration between municipal departments, research, the private sector, civil society organisations and the affected populations. Earthquakes, floods, typhoons: citizens are immediately warned. They can also learn about measures to be taken (risk maps, emergency kits, hotline). 40% of young people use the tool and they play the role of informants in their families. In 2017, the platform won the ICCG Best Practice Award.

[www.layertechlab.com](http://www.layertechlab.com)



# AWARENESS

## AROUND THE WORLD IN 80 INITIATIVES

**Through their daily living practices or their current consumption choices, citizens have a greater or lesser impact on their environment and GHG emissions. In a study published in September 2018, ADEME measured for example the carbon weight of various categories of household goods. Its results confirm that citizens are able to have a positive or negative impact on GHG emissions throughout product lifecycles: from their choices in respect of purchases, use and end of life of the goods they consume, such as buying smaller televisions or opting for second-hand textiles. By creating a link between individual acts and issues of management of collective actions, the awareness-raising that takes place closer to the context of everyday life, in particular by local authorities, invites citizens to rethink and influence their behaviours towards more sustainable practices. Several local authorities are of note for their ambitious strategies to raise awareness of these issues.**

As a frequent awareness-raising tool, education and training programmes for citizens of all ages help to provide an understanding of the impact of everyday choices on resources, thus encouraging the adoption of new habits and practices. These campaigns address the areas for which municipalities are responsible, in particular waste recycling efforts – which, at the same time, can be a way of meeting health targets. For example, in 2018, Istanbul undertook a mass energy efficiency campaign with school-children, students and council employees, while Dakar brought together 2,000 people on a walk against plastic waste. This type of participatory event anchors the learning and adoption of new behaviours in concrete actions.

Innovative approaches are being developed. The use of gamification and competition mechanisms transforms awareness campaigns into fertile grounds for experimenting in citizen participation and education. For example, in Arad, Romania, where a homeowners' associations competition encourages and rewards the re-greening of buildings, while in 2019, Exeter will unveil the responses of its inhabitants to climate issues via the Minecraft modelling game. Digital tools offer a multitude of new awareness-raising materials. Local authorities are focusing on investing in them - for example Lyon, Grenoble, Saint-Étienne and Clermont-Ferrand, which are all promoting the Wasteblasters smartphone game to educate children about saving energy and waste. Similar processes are also used to train local authorities

and elected officials in decision-making and in the development of climate governance tools. "Toolboxes" are proliferating, especially in areas exposed to climate change.

While many cities are converting to the smart city model, some are choosing to use the masses of data collected for awareness-raising purposes - for example, Amsterdam, where this information is being made public for citizens to learn about their collective progress. In another approach, Liverpool's ambition is to become the first "climate-positive" city in the world, by using a blockchain platform to offset the carbon footprint of any daily item or daily service by investing in a forest conservation project, thus guiding citizen choices.





# AWARENESS

## AROUND THE WORLD IN 80 INITIATIVES

### FRANCE

#### ***Battery collection in five Breton ports (Saint-Quay-Port d'Armor, Ligué, Port-la-Forêt, Lorient and Crovesty)***

The recreational boating sector, a big consumer of batteries, is still poorly equipped to collect this specific type of waste. Since 10 May 2018, the Scirelec-Batribox eco-organisation and the Brittany Region have set up the "Piles à quai!" ("Batteries Ahoy!") operation – an experiment in the collection of batteries in five marinas in Brittany. More than 40 collection points have been set up to raise awareness about sorting and to publicise this recycling channel. If this initiative is successful, it could be rolled out to the 73 ports of Brittany. In 2016, 668 tonnes of batteries were collected in Brittany, the equivalent of 202 g/inhabitant.

[www.batribox.fr](http://www.batribox.fr)

### ROMANIA

#### ***In Arad, an annual competition of owners' associations***

"Aradul Curat" ("Clean Arad") is a competition organised by the city council of Arad to promote initiatives to improve the urban environment. Open to homeowners' associations, the jury evaluates the overall appearance of buildings and green spaces (maintenance of the land, hedges, trees). In order to encourage greening, the winners are awarded gardening tools and planting equipment. Recognised as good practice 2018 in the European Green Capital selections, this competition provides the city with an opportunity to enhance community initiatives while identifying areas requiring urban renewal.

<http://ec.europa.eu>

### NETHERLANDS

#### ***Amsterdam, urban data as an awareness-raising tool***

With "Energy Atlas", its new platform launched in 2018, the Amsterdam city council is raising awareness about energy consumption and the savings that can be achieved.

The service is based on the urban data that Amsterdam has chosen to make freely available: citizens can freely query their own energy consumption and the consumption of the companies in their surroundings. Companies can also query their consumption and that of others, while learning about the possibilities for providing renewable energy by viewing the nearest production sites.

<https://amsterdamsmartcity.com>

### SENEGAL

#### ***Dakar mobilises its citizens against plastic waste***

As part of the implementation of its local Climate Energy Plan (PCET), the Dakar city council is developing a campaign to raise citizen awareness about the environment. On 1 July 2018, a green walk was organised - bringing together more than 2,000 participants - to raise awareness about eco-actions and eco-citizen initiatives. The theme was combating plastic waste and the walkers collected all the waste that they found on their 7.6 km route. Recovered plastic bottles were returned to recycling circuits and other categories of waste were used to manufacture public benches. Several other events of this type will be organised during the three years of the PCET.

[www.villededakar.org/](http://www.villededakar.org/)

**UNITED KINGDOM*****Exeter, inclusive innovation through video games***

Since May 2018, Minecraft, the famous video game, has been used by the city of Exeter to call on citizens, especially young people, to devise solutions for sustainable urban planning. The game was developed by Exeter Energy City Futures, a community interest company set up to address the city's urban development challenges. The game presents five "challenges" to which players are invited to respond: a car-free city centre, alternative energy sources, "super" bike paths and sustainable buildings. The best answers will be unveiled in early 2019, followed by the development of a final map of the innovative solutions.

<http://www.exetercityfutures.com/minecraft/>

**UNITED KINGDOM*****Liverpool, discouraging and offsetting polluting activities with blockchain***

This is a world first - since July 2018, Liverpool city council has been in partnership with the Poseidon Foundation, to use its blockchain-based platform. The system enables consumers and businesses to trade carbon credits and offset their emissions. This system relies on transparency and traceability to provide a deterrent to highly polluting activities. At the same time, the Poseidon Foundation is planning education and awareness-raising initiatives in schools and universities. The City plans to use the system to offset its carbon footprint by 110%, i.e. to offset more emissions than it actually produces.

<https://poseidon.eco/>

**TURKEY*****Istanbul, awareness-raising campaign reaches 33,000 school children***

In 2018 Istanbul city council organised a major energy efficiency awareness-raising campaign for school children and council employees. Several conferences and workshops were organised to motivate the public to adopt energy-saving habits and reduce their waste and water consumption. The first two-month campaign reached 4,386 students in 37 establishments and 1,000 council employees. Over the whole year, the campaign reached 33,000 children. The campaign is part of Istanbul's broader desire to develop renewable energies and reduce its consumption, in order to meet its commitment to a 20% reduction in its CO<sub>2</sub> emissions under the Covenant of Mayors.

[www.sustainablecities.eu](http://www.sustainablecities.eu)

**INDIA*****Bangalore now has a "Bicycle Mayor"***

In May 2018, Sathya Shankaran was named the Bicycle Mayor for the City of Bangalore, from among 19 candidates. His role will be to bring together the cycling community, to raise awareness among the young and promote the establishment of facilities with the government. The appointment is the initiative of the Danish NGO Bycs, which has also participated in the establishment of bike-dedicated days "Cycle Days" in partnership with the city council. Bangalore is the third city in India to have a Bicycle Mayor. The city wants to get rid of its recurring traffic congestion problems by enhancing the use of bicycles: it is targeting 50% of urban trips by bicycle by 2030.

<https://bangalorecycleday.wordpress.com/>





# DECENTRALISED COOPERATION

AROUND THE  
WORLD IN 80  
INITIATIVES

**Through sharing experiences and good practices, encouraged by different stakeholder experiences, decentralised cooperation helps to strengthen local capacities for action. A recent report of the United Nations Office for South-South Cooperation (UNOSSC) shows that cooperation projects in developing countries are willingly embracing the Sustainable Development Goals but there is limited work on SDG 13 on climate action. Although mitigation and adaptation to climate change are not always at the top of the partnership agendas, they are nevertheless integrated, even in an underlying way, into project commitments. French communities have a special role in this scenario, as their cooperation is integrated in the political culture of local elected representatives, and supported at the national level by the state and by the EU at the regional level.**

The first challenge is to strengthen the capacity for action of local officials. This is the aim of the partnership between the Burkinabe region of Plateau Central and Nouvelle Aquitaine, or the deployment of climate observatories between Hauts-de-France and Minas Gerais in Brazil. Such links are used to disseminate within administrations and communities, the knowledge gained from the experience of their peers in different sectors impacting GHG emissions, to facilitate access to funding for project holders and to acquire the tools for implementing, monitoring and evaluating climate plans. Other cooperations strengthen local energy production capacity and autonomy, while enhancing the resources available: for example, projects producing natural gas from organic waste, such as in Saint Louis, Senegal or the long partnership between the municipality of Edegem (Belgium) to improve recycling and composting in San Jeronimo (Peru).

Territorial cooperation is already highly developed in integrated spaces such as the EU, whose Interreg programmes provide, for example, a framework favourable to sharing and reproducing practices. Since 2017, for example, the French and Italian communities of the Upper Tyrrhenian region have been engaged in joint working on the ADAPT project to strengthen their climate resilience. A European multi-stakeholder coalition for development, led by the Council of European Municipalities and Regions (CEMR) and supported by the EU, the Platforma initiative facilitates cooperation between local and regional authorities in Europe and beyond. Its

project CONNECT, trialled in 2017, opens a new approach to decentralised cooperation, by organising knowledge sharing between peers at the same level. In this context, last October Barcelona, Manaquiri (Brazil) and Sri Lankan municipalities formed a partnership to share information on urban planning tools. Turin, Riga, Bilbao and Tours have also formed a long-term partnership to promote local environmentally-friendly food production systems with African partners.

Outside the usual channels of cooperation, new currents are appearing. South-South exchanges or triangular partnerships, make it possible to reinforce the horizontality of exchanges between stakeholders experiencing similar problems, and facilitates the transferability of practices. Agriculture, which is the foundation of the economies of many countries of the South, is particularly central in South-South cooperation initiatives. For example, the project carried out in 2017 by communities in Cuba, Fiji and the Solomon Islands on sustainable agriculture, responds to both the food security and sustainability requirements of a clean agricultural economy.





DECENTRALISED  
COOPERATION





# DECENTRALISED COOPERATION

**AROUND THE  
WORLD IN 80  
INITIATIVES**

## **LILLE (FRANCE) & SAINT-LOUIS (SENEGAL)** ***Development of the biogas sector***

With the support of DAECT under the 2016 Climat II call for projects, cooperation with the city of Lille has enabled the development of the biogas sector in Saint-Louis, Senegal, with 21 biodigestors in operation at the end of 2017. The project aims to combat fuel poverty, while providing a small-scale, urban wastewater and organic waste treatment solution. The partnership has included support for the training of masons and businesses, the organisation of training and awareness sessions for households and the creation of two local monitoring committees. The installation of 25 new units in Saint-Louis is planned for the end of 2018 and 80 units at the regional level by 2020.

<https://international.univ-lille.fr/>

## **NANTES (FRANCE) & DSCHANG (CAMEROON)** ***Cooperation for composting***

Through this biowaste to compost recovery project, supported by Nantes Métropole, the EU and the Compostri association, Dschang Council now manages a household waste composting unit that enables it to process 1,000 tonnes of waste per year. Nantes Métropole has been involved financially and in staff training through exchanges with Kindia in Guinea. The objective for 2018 is to achieve 10,000 tonnes/year and for it to be self-funding through the sale of the compost and the use of carbon credits. This project is part of the Nantes Métropole DANK decentralised cooperation programme, a partnership between Dschang, the Association of Mayors of Grand 'Anse (Haiti), and the Kindia Council (Guinea) for waste management, access to water and sanitation.

<http://www.compostri.fr/cooperation/>

## **NOUVELLE-AQUITAINE (FRANCE) & RTHE PLATEAU CENTRAL REGION (BURKINA FASO)** ***So'Faso project***

Cooperation between Nouvelle-Aquitaine and the region of Plateau central in Burkina Faso is promoting the sustainable development of these two regions through exchanges between stakeholders. In particular, it has led to the creation of a Climate Energy Plan for Plateau Central, to construct 23 drinking water supply systems, including one with a solar powered pump, and to raise the awareness of 16,420 users on complying with hygiene rules and the protection of water resources. In terms of agricultural development, six educational farms have been created, with 7,400 farmers trained in agro-ecology and 12,600 trees planted. The So'Faso three-year programme (2016-2018) won the Platforma Awards for decentralised cooperation in 2018. The two Regions have committed, for 2019, to implementing a programme for access to renewable energies in the rural areas of Plateau Central.

[www.nouvelle-aquitaine.fr](http://www.nouvelle-aquitaine.fr)

## **JUVISY-SUR-ORGE (FRANCE) & TILABERI (NIGER)** ***Degraded Land Reclamation Project***

As part of its twinning with Juvisy-sur-Orge, 67 ha of degraded land have been restored in this area plagued by Tilaberi droughts. The production of 372 water retention terraces and the cultivation of 6,324 plants and seeds (grass, trees) has helped to start land regeneration and to control runoff. Completed in 2017, this adaptation project enables the inclusion of villagers in the fight against the rural exodus: awareness and training sessions, better land fertility and cash-to-work compensation for workers. The project has received the support of the MAE (call for climate project II) and the Departmental Council of Essonne and is part of the community development plan of the Tilaberi community.

<http://juvisy.fr/votre-ville/jumelages/>

**FRANCE, MALI,  
MAURITANIA & SENEGAL****Getting citizens involved with RECOPACTE**

In partnership within the "Network of Communities for the Citizen Participation of the Territories", Grand Paris Sud and Evry (France), Dakar (Senegal), Commune V of Bamako and Kayes (Mali), Nouakchott and the Mauritanian Association of Municipalities of the South (Mauritania) are collectively committed to involving citizens in the definition and implementation of joint sustainable development projects, by sharing good practices and transferring experiences, in partnership with Arène, Ile-de-France. Since 2017, the City of Dakar - in partnership with Grand Paris Sud - and the Urban Community of Nouakchott, CoMSSA prizewinners, have made the choice to pool respective Climate Plan strategies with one another and with all RECOPACTE member territories.

<https://www.grandparissud.fr/>

**EDEGEM (BELGIUM)  
& SAN JERONIMO (PERU)****Cooperation for waste management**

The collaboration between Edegem (Belgium) and San Jeronimo (Peru), selected as a good practice at the 2018 Platforma Awards, has focused on composting food waste since 2005. A collection system has been set up, with the recovery of organic waste from the Vinocanchón market and residents who are trained in selective sorting. A plot of land is lent by farmers who can use compost. In 2016, a recycling centre was created (1.5 tonnes of waste per day). The project also has a social dimension, thanks to the improvement of the working conditions of the recyclers.

<http://platforma-dev.eu>

**GUÈDE CHANTIER (SENEGAL)  
& DAMANHUR (ITALY)****Twining of two eco-villages**

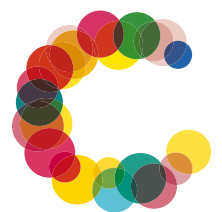
At the end of March 2018, 1,400 fruit trees were planted in this eco-village of 7,000 inhabitants in Guède Chantier (Senegal), thanks to cooperation with Damhanur, another eco-village in northern Italy. Since 2014, this twinning has sought to share experiences between these two communities, which are in different situations but also which also have a lot to share (sustainable irrigation systems, organic farming, compost, hives, etc.). Training in the conservation and processing of agricultural products was also organised in March 2018. This cooperation has led to an increase in the food autonomy of this community, which has abundant production in the cool season, but encounters difficulties during the rest of the year, while fighting against deforestation and land degradation.

[www.damanhureducation.it](http://www.damanhureducation.it)

**CUBA, FIJI & SOLOMON ISLANDS****Promoting organic agriculture across the Pacific**

In Cuba, 14 sustainable agriculture projects involving 1,216 families have been launched with support from the Global Environment Fund. In May 2015, a visit by farmers from the Solomon Islands, El Salvador, Fiji and Guatemala, as well as workshops, led to the sharing of experiences by showing how low-cost and environmentally friendly practices can be implemented in the Pacific (vermiculture, irrigation methods, solar energy pumps, etc.). Based on the methods learned, 17 demonstration farms were set up in Fiji in 2017 and good practices will also be disseminated through POET.

[www.thegef.org](http://www.thegef.org)



**CLIMATE  
CHANGE**