



# The Role of City-Regions in the Achievement of a Low-Carbon Economy

**A workshop organised by COST and the Directorate General Joint Research Centre of the European Commission**

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## Summary

Europe is committed to taking action to achieve a zero carbon economy based around the 'energy trilemma' of climate change, security of supply and affordable energy. The COP21 agreement has captured global buy-in to reducing CO<sub>2</sub> emissions. However, for these policy initiatives to succeed there must be action on the ground through everyday projects.

The Role of City-Regions in the Achievement of a Low Carbon Economy workshop was initiated by the COST Action TU1104 Smart Energy Regions network. The Action brought together 45 representatives from the 'knowledge triangle' of government industry and research, to discuss whether and how greater emphasis can be placed on bottom-up activities to speed up the low carbon transition in the built environment.

The workshop concluded that:

### 1 Policy is slow to permeate into practice

*How can the transition of policy into practice be speeded up and how can regulations and incentives help in this process?*

- Connect between policy goals and their practical implementation
- Reduce conflicts around policy and lobbying, procurement, regulation and innovation
- Encourage and incentivise 'doing better' with more aspirational targets rather than the culture of minimum standards
- Empower consumers by providing information and an understanding of choice
- Use the knowledge triangle of Government, Industry and Research to spin out innovative solutions
- Maximise the impact from research programmes to provide a greater knowledge and understanding to government policy makers, industry and the public at large on visioning a future 'zero carbon' built environment.

### 2 Business as usual will not meet the political targets

*To what extent can industry and government respond to the change required, and what new industries and business models are needed?*

- Challenge the status quo to remove the obstacles that inhibit the transition to a zero carbon built environment
- Aim for a systemic change rather than incremental change, not just in technology,

but also in socio-economic processes and governance

- Review existing frameworks of procurement, standardization and regulation, which may lock-in to old technologies and processes
- Develop new integrative finance tools that encapsulate multiple benefits and risk management
- Encourage co-creation and responsible innovation across end-users and supply chains, engaging with technical solutions and their implementation to add value and encourage a fast take-up
- All sectors of the construction industry need to engage with zero carbon goals
- Encourage old industries to adopt change and new industries that will commit to the zero carbon agenda.

### **3 A new equilibrium between top-down and bottom-up solutions is needed**

*What is the appropriate balance of top-down and bottom-up and how can this be operationalised?*

- Increase the emphasis on bottom-up activities in relation to the balance of top-down and bottom-up
- Use ‘middle out’ agents to operationalize bottom-up activities in response to top-down policy

- Encourage bottom-up disruptive innovation to lead to a faster change in low carbon markets
- Provide clear vision and leadership across all levels, in government, industry, third-sector and communities.

### **4 Differences across Europe should be recognised**

*How can the transition to a zero carbon built environment recognise differences across countries and regions, and bring ‘up to speed’ areas less equipped to deal with the transition?*

- Encourage mechanisms for sharing information within and across countries and regions
- Build on and encourage interaction across existing networks, such as the Covenant of Mayors, EUROCITIES, and COST Actions.

## Context

The workshop's main aim was to discuss the importance of both bottom-up and top-down solutions in accelerating the penetration of low carbon policies into practice.

Following on from the Paris COP21 recommendations<sup>1</sup>, it is becoming widely recognised that real sustainable change can only come about through employing a bottom-up approach, where local bodies identify their environmental issues and provide the link with national level environmental policies. The COP21 agreement<sup>2</sup> is itself based on a “bottom-up” approach, in which each country submits its own individualised plan for reducing or limiting emissions from fossil-fuel burning, recognising that countries have different economic capacity, poverty levels, and economic diversity.

The Competitiveness Council Conclusions on progress in the European Research Area of 21 February 2014 confirmed the need to “facilitate transnational cooperation and sharing of information”<sup>3</sup>. The priority areas identified included key societal challenges central to the workshop, namely “Secure, clean and efficient energy”. The transition to a low

carbon, resource-efficient economy demands a fundamental shift in technology, energy, economics, finance and ultimately society as a whole<sup>4</sup>, requiring bottom-up mobilisation of Governments and non-State actors, such as business, investors, cities and civil society. Citizens and businesses will take ownership of the energy transition, benefit from new technologies to reduce their bills, participate actively in the market, and where vulnerable consumers are protected. There will be a shift away from a fossil fuel driven economy, where energy is based on a centralised, supply-side approach and which relies on old technologies and outdated business models, and away from a fragmented system characterised by uncoordinated national policies, market barriers and energy-isolated areas<sup>4</sup>. Consumers will be empowered with information, choice, and through creating flexibility to manage demand as well as supply.

However, there are concerns that current initiatives are not sufficient to overcome the growing disconnect between policy goals and their practical implementation. The World Energy Council reported that “*No one, neither policymakers nor business leaders, believes*

*that we can go forward with business as usual. Everyone realises that there is a need to move towards an entirely new, balanced, low-carbon energy system. But in order to achieve this energy transformation, the energy sector needs a clear roadmap – one that can only be achieved by coming to a consensus and setting an internationally accepted target”.*<sup>5</sup>

Although, on the one hand, Europe has made encouraging progress towards reducing CO<sub>2</sub> emissions and in meeting 2020 targets<sup>6</sup>, on the other hand, there seems little evidence of any wide-scale change in behavior and practice. It may be that these emission reductions are a result of capturing the “low hanging fruit” of subsidised renewables and energy efficiency measures (e.g. LED lights), coupled with a downturn in industry through economic austerity and the move of manufacturing activities to outside of Europe.

Resources, for example, through Horizon 2020, have been secured to reach ambitious objectives in terms of research and innovation, but this does not appear to be leading to the rapid adoption of sustainable technologies by the market. The World Energy Council identifies in relation to

COP21<sup>5</sup> “As previous *World Energy Trilemma* reports have highlighted, there is often a gap between these important negotiations and what is happening on the ground.”

There appears to be a growing gap between policy and practice in relation to the implementation of low carbon technologies in the built environment, which will place pressure on achieving CO<sub>2</sub> emission reduction targets in line with future 2030 and 2050 goals.

Although *bottom-up* is a widely used term, most of the reference has been through top-down policy related statements, rather than bottom-up activity-lead thinking. In the built environment, zero carbon new build is slow to develop, retrofitting existing buildings difficult to properly finance, and renewables and storage have depended on erratic subsidies. Overall there seems little appetite from the construction industry to embrace the low carbon agenda. This is paralleled with a general unawareness by society, including some governments, of what is possible now, with today’s technology.

**The current emphasis is on top-down solutions, whereas bottom-up activities may offer**

**distinct advantages of ease of implementation and local benefits, whilst reducing the pressure on top-down solutions, making them potentially easier to implement. Any future energy scenario must combine top-down and bottom-up approaches: the first should set the framework and incentives, so that the latter can occur in the broader market, ideally identifying and implementing best practices. There may be benefits from shifting the emphasis from top-down to bottom-up in order to speed up the penetration of low carbon technologies in the market.**

In the built environment, a bottom-up led approach may focus on a systemic combination of reducing energy demand, increasing the share of renewable energy and energy storage capacities at the scale of individual buildings or communities. Such an approach is closely related to local issues of reducing pollution, affordable energy and green jobs.

The COST-JRC Joint Workshop was organised to explore this argument through invited talks and round table discussion. The focus was on city-regions, as their contribution is crucial in the achievement of a low carbon economy, and they

are first to experience the negative externalities of CO<sub>2</sub> emissions and are often front-runners charged with the implementation of innovative solutions, especially in energy and environmental standards for buildings.

## Challenges

The following main challenges were identified by the participants during the workshop's presentations and roundtable discussions:

### 1 Policy is slow to permeate into practice

It was agreed that the transition from low carbon policy into practice is slow. A range of reasons was given for the growing gap between policy and practice, including, a lack of societal acceptance and people slow in adopting change. There appears to be a conflict between subsidies and other types of market and a clash between politics (top-down) of change, and political lobbying to resist change (industry, local administrations). Also, there should be more emphasis on incentives rather than relying on prescriptive approaches, for example relating to building energy regulations.

**How can the transition of policy into practice be speeded up and how can regulations and incentives help in this process?**

## **2 Business as usual will not meet the political targets**

It was generally agreed that business as usual would not meet the challenge of a transition to a zero carbon economy in line with Global and European targets. There is a need for systemic change rather than incremental change, not just in technology, but also in socio-economic processes and governance. Also, existing frameworks of procurement, standardization and regulation, may lock-in to old technologies and processes.

**To what extent can industry and government respond to the change required, and what new industries and business models are needed?**

## **3 A new equilibrium between top-down and bottom-up solutions is needed**

There was general agreement that any future energy scenario must combine top-down and bottom-up approaches. Top-down may set the framework and incentives, so that bottom-up

can occur in the broader market, ideally identifying and implementing best practices. There may be benefits from shifting the emphasis from top-down to bottom-up in order to speed up the penetration of low carbon technologies into the market. However, where top-down is generally clear and manageable, and involves the existing players and structures, bottom-up may be “messy” and difficult to manage due to its disparate nature, and may require organisational change.

**What is the appropriate balance of top-down and bottom-up and how can this be operationalised?**

## **4 Differences across Europe should be recognised**

Different regions in Europe have different mentalities and approaches. There are also differences in resources and flexibility in the administration, and different capacities and access to information. Some regions and cities are faster in adopting change than others. Some countries or regions might be more concerned with their economies in the short term, rather than with mitigating climate change.

**How can the transition to a zero carbon built environment recognise differences across countries and regions, and bring ‘up to speed’ areas less equipped to deal with the transition?**

## **Tackling the challenges**

In order to respond to the above challenges the Workshop participants identified a number of areas to be addressed.

### **1 Define top-down and bottom-up**

Whereas there was general agreement that a combination of top-down and bottom-up approaches is necessary, a clearer definition is needed. For example, from a national perspective, cities and regions may be considered to be engaged in bottom-up activities, but from a business and citizens perspective they may be considered top-down agents. It was agreed that there should be a shift in emphasis from top-down to bottom-up. But there are other issues to consider, such as scale, location, and project type. There is also the different implementation of the same set of measures between north and south Europe, due to climate and local political and cultural reasons.

In general, most energy policy is driven by a central top-down supply-led approach. From a built environment perspective, a top-down approach represents the actions and interests of big government and big industry, for example, in relation to grid based energy supply, regulations and national and international carbon emission reduction targets. On the other hand, a demand-led bottom-up approach represents the interests of the end user, whether individuals, organisations or communities, in relation to their specific building and built environment needs.

***“The good thing about local solutions is that they can be deployed very quickly,”*** Cooper said, venting his frustration with the UK’s approach to climate policy. ***“Every time we have a good idea, it seems as if the government takes it away from us”<sup>6</sup>***

Cities and regions may act in an intermediary way in interpreting national policy targets into local regulations and planning guidance, taking account of local needs and aspects. However, leadership is also required at lower levels of activity such as communities and SME’s.

## 2 Support co-creation with end-users and supply chains

Co-creation is a term used where the end-users and supply chains are engaged with technical solutions and their implementation, to add value and encourage a faster take-up. The scale of the climate change challenge requires a new mode of innovation, with changes in systems of practice, not just single innovations in products, and should be challenge-led and demand-led, rather than technology driven. It requires a broad range of players with a focus on activity, since the urgency of low carbon transformation requires a change in the day-to-day practices of professionals. Many transformations will relate to socio-technical systems such as mobility and household living, and occur in ‘places’, e.g. housing estates, cities.

## 3 Support responsible Innovation

Innovation is needed across a range of activities, in addition to technology, including processes associated with socio-economic and governance. Responsible Innovation seeks to promote creativity and opportunities that are socially desirable and undertaken in the public interest in an open, inclusive and timely way through a collective responsibility, where funders, researchers,

stakeholders and the public all have an important role to play. It should account for effects and potential impacts on the environment and society. Innovation can be risky, especially at urban level, and there are issues related to who covers the risk, as well as a general lack of risk sharing. Innovation must be financially feasible and risks need to be shared. There is the need to build capacity in relation to access to information through supply chains and end users. It was recognized that most technical innovations are bottom-up. A systemic change may require disruptive innovation, rather than incremental, where a product or service takes root initially in simple applications at the bottom of a market and then relentlessly moves up market, eventually displacing established competitors.

## 4 Review procurement

Innovation may conflict with procurement, where standards and frameworks may protect the status quo and dis-incentivise the application of emerging technologies and processes. There are tensions between the new “innovation”, and the old status quo, which may be protected by procurement processes. New rules of procurement need to be developed that are flexible to accommodate change, whilst safeguarding

organisations and citizens from unreasonable risk. Opportunities are often accompanied by mixed-messages resulting in a culture of reluctance to do things differently.

## 5 Develop finance tools

Appropriate finance models need to be developed to help understand cost and value of different solutions. Current cost models may disincentivise innovation, for example, new technologies may have an additional cost risk associated with them. Many cost models are additive rather than integrated. For example, increasing thermal insulation will incur a cost increase that could be offset by reductions in heating system costs if a more integrative cost analysis is carried out. Future finance tools should include life cycle costs and account for multiple benefits, for example, socio-economic factors such as productivity, health and well-being, job creation and skills. In this way, current ‘difficult to fund’ projects, such as wide-scale housing retrofit, may prove financially acceptable.

## 6 Develop more flexible regulations

Regulations can encourage innovation by raising the bar in terms of performance. Regulations

and incentives should not be ‘one size fits all’ minimum standards, but could be more flexible, localised and aspirational, to respond to individual projects. The top-down approach tends to focus on prescriptive change as opposed to incentivising change. Aspirational goals, empowerment and engagement are part of the co-creation process, as opposed to minimum standards and risk adverse solutions. Therefore ‘minimum standards’ regulations should be linked to ‘best practice’ aspirational targets, with incentives and information for “doing better”, including an increased understanding of the likely financial and social returns.

## 7 Achieve stronger social acceptance

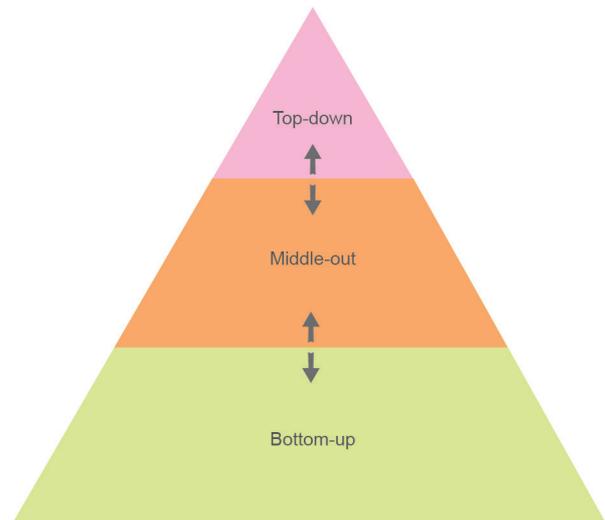
Social acceptance of the zero carbon agenda by clarifying the benefits to citizens and cities is key for having their support. An increase in understanding is needed, combined with training, in order to limit contradictory messages from various sources. There appear to be more limitations than opportunities, and the “need for change” message needs to be directed at targeted audiences. Underlying this is the need to foster trust between top-down and bottom-up actors. Stronger social acceptance would potentially lead to an increase in demand for

low carbon technologies through an increased awareness of the socio-economic multiple benefits associated with them.

### 8 Stimulate the entry of new industries

There needs to be a cultural change within organisations. Old industries are sometimes slow to change and are locked in to existing procurement processes and overall culture. There are conflicts between subsidies and other types of market, and a clash between top-down political aspirations and counter-active political lobbying, both from industry and local administrations, representing a range of perspectives. New industries that will commit to the zero carbon agenda should be encouraged into the market through government incentives for start-up and risk sharing. New small companies have a greater potential to innovate as they are not bound by a legacy of old ways of thinking.

### 9 Activate “middle-out” agents



It was strongly recognised that there is a need to activate “middle-out agents”, who can trigger change, make informed decisions, and are properly equipped to implement systematic change through best practice and operational excellence. Synergies should strive for economic development, bringing together the triangle of government, universities, industry and other stakeholders at a city/regional level. Middle-out agents can facilitate the communication between all actors of this knowledge triangle. They would be more likely to establish trust with citizens and community groups, who may feel a disconnect with big industry and big government. Middle-out agents will therefore need to establish a profile of honesty and accountability at all decision-making levels, to manage citizen

expectations. They should integrate leadership and local initiatives, and lead to aspirational solutions, rather than minimum standards. They can facilitate empowerment and engagement of bottom-up actors, and ensure a customized implementation given regional priorities, and provide the flexible administration to implement change.

## 10 Share information

There is a need for information sharing, both within and across countries and regions, recognising the differences that exist in capacity and capabilities. Many cities and regions already have a range of low carbon and clean environment projects. However, they are often poorly connected to each other and there is a lack of strategic coherence that could facilitate system wide transformation that links individual grass-roots projects and overall city ambition. There is a need for data sharing on project implementation, and on the impact of policies. More transparency is needed, by involving the public in these processes.

## Key recommendations

The President of the European Economic and Social Committee (EESC), George Dassis, stated that ***“(...)it is mainly the civil society on the ground in our regions which will take care of this implementation (of COP21). Decisions must, therefore, be a broad consensus in society and benefit from businesses participation, unions, all the other parts of civil society and local and regional authorities.”***

The adoption of low carbon technologies and processes needs a ‘joined up’ approach across a range of actors, with actors prioritising specific responsibilities in terms of tackling the challenges.

### 1 European Union and Member States

*Support responsible Innovation, review procurement, develop more flexible regulations, stimulate the entry of new industries, share information*

The European Union and Member States are the main source of top-down actions. However they should also provide a clear route map to the implementation through practice and bottom-up activities. They can provide incentives for innova-

tion and review procurements processes. They can also take the lead in encouraging industry take-up both by existing and new industries, developing the low carbon economy. Systems can be set up for sharing information both within a member state and across the EU and further afield.

## 2 Cities and Regions

*Support co-creation with end-users and supply chains, support responsible Innovation, review procurement, develop finance tools, develop more flexible regulations, achieve stronger social acceptance, stimulate the entry of new industries, activate “middle-out” agents, share information*

Smart cities and urban communities are the place where a big part of the future transformation will actually happen. Work at city level and urban policies will be intensified through the activities of the Covenant of Mayors and their setting up of a “one stop shop” for local authorities.

***“In the EU the most outstanding demonstration is the Covenant of Mayors. So far 6.500 local and regional authorities representing***

***200 million people have voluntarily agreed to meet and exceed the EU’s 20% CO<sub>2</sub> reduction objectives by 2020. Signatories recently took this a step further agreeing to cut at least 40% of GHGs by 2030 and to integrate climate adaptation measures,”***  
Committee of the Regions’ President, Markku Markkula.

Cities and regions should be *the* “enablers” in the context of a future low carbon economy. They provide a hub for knowledge and understanding of what a given area has to offer. They can secure citizens support for, and involve them in, the conversion of the urban infrastructure and their community, including households and businesses.

Cities and regions are often responsible for building regulations, planning guidance and setting up procurement frameworks. These need to link to the needs of citizens, including setting up middle-out agents, and where appropriate use these powers to drive innovation, whilst responding to national and European targets and directives.

The biggest challenges going forward will be

dealing with existing buildings and converting the network infrastructures (transport, water, sewage, waste). The adverse impact on the environment and vulnerable social structures should be minimized. There is a growing level of fuel poverty and a need for retrofitting houses and other building types. Historic districts need large scale application of measures, whilst maintaining cultural and community structures.

Demonstration projects at city level involving cities as living labs, can test new approaches and accelerate innovation and spin-out. This must then lead to scale-up for wider application through sharing information, where cities and regions can help in taking the initial risk, and by implementing regulations and providing infrastructure opportunities that enable change.

### 3 Middle-out agents

*Support co-creation with end-users and supply chains, support responsible innovation, develop finance tools, achieve stronger social acceptance, stimulate the entry of new industries, share information.*

Future visioning needs to recognise the role of middle-out agents as intermediary actors,

perhaps as a voluntary partnership of actors having a common vision and ultimately to create an ecosystem to steer, promote and foster change. They can provide orientation and support local and regional players during the implementation of change, and can initiate local clusters that bring stakeholders together in every sector. They may come from the current non-profit community focused sectors, or be an extension of local and city authority structures. It is important that they are able to provide independent thinking and are not aligned with commercial vested interests.

### 4 Industry

*Support co-creation with end-users and supply chains, support responsible Innovation, review procurement, develop finance tools, achieve stronger social acceptance, stimulate the entry of new industries, activate “middle-out” agents, share information.*

All sectors of the construction industry need to engage with the zero carbon agenda. Old industries need to change and new industries will emerge that will commit to the zero carbon agenda from the outset. There is a need to recognise the range of industries in the low

carbon built environment, including energy suppliers, construction companies, developers, manufacturers and the design, engineering and planning professions.

The non-homogenous nature of industry stakeholders should be recognised, with some resisting, and some welcoming change. In some countries, the more traditional large industries, such as house builders, are often conservative in nature and may initially resist change. However, there are recent positive signs that the big energy companies are changing their approach, and embracing a top-down bottom-up mix of central, distributed and renewable energy, combined with demand-side control. Manufacturers may welcome change through innovative new higher value products.

## 5 Communities

*Support co-creation with end-users and supply chains, support responsible Innovation, achieve stronger social acceptance, stimulate the entry of new industries, activate “middle-out” agents, share information.*

As more people take on responsibility for their energy management and impact of their

lifestyles on the environment, there is a need for sharing information and aspirations. This will create multiple benefits associated with healthier and more active communities, which should lead in turn to economic opportunities. Middle-out agents are needed to help citizens realise acceptable and realistic solutions to eliminate their emissions, by using less energy, and generating energy from renewable sources, as well as adopting local ‘nature based’ infrastructures. They can provide communities with expertise to develop Action Plans, setting targets and identifying opportunities and potential barriers, and raising funds. For example, not-for-profit companies or communities can work to provide an interface between communities and government, funding organisations and energy suppliers.

## 6 Researchers

*Define top-down and bottom-up, review procurement, develop finance tools, develop more flexible regulations, achieve stronger social acceptance, share information.*

The research sector must provide a greater knowledge and understanding to inform government policy makers, industry and the

public at large on visioning a future ‘zero carbon’ built environment, in a language that all can relate to, in their everyday decision making situations, and ultimately everyday life, and highlighting the role of all people. They can help create a bottom-up demand for zero carbon solutions.

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