

Low Carbon Energy 2050 – Local and Regional Impact and Perspectives

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List of Acronyms

CC	Climate Change
CO ₂ e	Carbon dioxide equivalent
CHP	Combined Heat and Power
EBRD	European Bank for Reconstruction and Development
EC	European Commission
EE	Energy Efficiency
EPC	Energy Performance Certificates
ERDF	European Regional Development Fund
ESCO	Energy Service Companies
EU	European Union
FEC	Final Energy Consumption
GDP	Gross Domestic Product
GHG	Greenhouse gas
ICT	Information and Communication Technologies
IEE	Intelligent Energy Europe
ISE	Index of Sustainable Energy
kWh	Kilowatt hour
LCE	Low Carbon Economy
LRAs	Local and Regional Authorities
MS	Member States
MW	Megawatt (10 ⁶ W)
MWh	Megawatt hour
MWp	Megawatt peak
NGOs	Non-Governmental Organisations
PJ	Petajoule (10 ¹⁵ J)
RCCI	Regional Climate Confidence Index
RES	Renewable Energy Sources
RE	Renewable Energy
ROI	Return on Investment
R&D	Research and Development
RTD	Research and Technology Development
SMEs	Small-and Medium-sized Enterprises

Summary

We need to achieve a transition to a low carbon economy (LCE) to drive the energy system towards sustainable production and use. Sustainable energy is a priority concern with regard to climate change (CC) and emissions reduction since *'energy related emissions account for almost 80% of the EU's total greenhouse gas emissions'* (European Commission, 2010).

EU 2020 targets for energy and CC are ambitious¹. According to latest estimates, greenhouse gas (GHG) emissions reduction and the share of renewable energies are likely to be met, but in terms of energy efficiency (EE) *'the EU will achieve only half of the 20% target in 2020'* (European Commission, 2011a; European Commission, 2011b).² Considering the longer term objective of reducing GHG emissions by 80-95% by 2050, compared to 1990, in order to keep global warming below 2°C (European Commission, 2011a), EU policies and measures also risk being insufficient if major changes are not made to the entire energy system (i.e. production, transformation, transportation, distribution and use). In fact, delivering according to existing policies, emissions will only be reduced by *'about 40% by 2050'* (European Commission, 2011c). Thus, the 2050 decarbonisation challenge requires that existing policies be strengthened and new policies be put in place to bring about the necessary changes for emissions reduction.

The decarbonisation path develops around two main challenges: an increasing share of renewable energy sources (RES); and energy savings. Responding to these challenges needs:

- Appropriate policy and legislative frameworks.
- Investments and access to capital, for example to replace old equipment.
- Structural changes in the power generation and distribution systems, for example in terms of more interconnected networks (i.e. smart grids) able to increase energy transmission capacity and to manage a more decentralised energy generation system based on local renewable production, e.g. solar photovoltaic or biomass.

¹ By 2020: 20% reduction in GHG emissions compared to 1990; 20% share of RE in the EU's energy mix; and 20% saving of EU energy consumption compared to 2020 projections (European Council, 2007).

² In this regard, in March 2011 the European Commission published the Energy Efficiency Plan and, in June 2011, a legislative proposal for a Directive on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC (COM(2011) 370 final).

- Research and innovation, delivering technological improvement (for safety, storage, supply, or transport purposes).
- Information and communication technologies (ICT), offering on the one hand ‘*potential for a structural shift to less resource-intensive products and services, for energy savings in buildings and electricity networks as well as for more efficient and less energy consuming intelligent transport systems*’ (European Commission, 2010), and on the other hand tools³ for social change, such as social networks used for EE communication and web-based competition games providing adaptive incentive mechanisms for energy saving.
- Adapted business models such as the third party funding of energy saving measures through Energy Service Companies (ESCO).
- Behavioural change, through awareness-raising and information dissemination on, for example, more energy efficient devices or solutions.
- Public acceptance of the changes needed, both in infrastructure and in the requirements for compliance.

At the local and regional level, low carbon energy development is, therefore, an integrated pathway where technological, structural and social changes would need, ideally, to be pursued altogether to meet the challenge of a future energy system transformation.

The scope of this report is to identify a set of framework conditions facilitating this transition to LCE by local and regional authorities (LRAs). The identification process is supported by the evidence provided through the detailed description and analysis of four successful experiences, two at the local and two at the regional level.

The level of success of the selected experiences was determined under Part 1 of this report, against a set of criteria for the identification of best practices, defined on the basis of a recent literature review. In particular, a three tier approach was considered appropriate for the selection process, as follows: *Tier 1 – Exclusion criteria*, referring to the availability of adequate information to make a full assessment of the initiative according to *Tier 2*; *Tier 2 - Main selection criteria*, including: (i) level of interaction with supportive regional/local policies, strategies and institutional settings for LCE development; (ii) impact and results (ii) sustainability; (iv) existence of clear linkages with national and/or EU

³ Targeting utility companies and commercial customers, as well as final consumers (the general public).

frameworks; and *Tier 3 - Additional criteria (reflecting an added value of the practice)* such as its potential for replication or its innovative character. By applying the above criteria, some 29 initiatives were screened and ranked from unsatisfactory to adequate and good. Out of the 29 cases, twelve were selected as ‘adequate quality’ cases and four as ‘good quality’ cases; the latter cases also responded to a good geographical balance across the EU.

The second part of the report (Part 2) focuses on the outline of a template structure for the description of the ‘good quality’ experiences and on explaining the selection methodology. In particular, the use of a specific structure was considered necessary to guide the collection of information on the relevant aspects of each case with respect to the selection criteria (Tier 2); and to provide a common framework for the assessment of achievements and the drawing of recommendations on requirements and preconditions facilitating the transition to LCE by LRAs.

Part 3 provides a detailed description of the four selected case studies.

The first case study, the *Energy 21: 2nd phase of the Upper Austrian Energy Concept* is an example of medium- to long-term regional policy for green energy development, well-designed, highly prioritising EE and renewable energy (RE), and effectively blending legal provisions, financial instruments and information and capacity building interventions. Additionally, the Upper Austria case demonstrates the importance of having a regional energy agency that takes the lead in all energy-related matters, including the cooperation with national, European and international energy stakeholders.

The second case study, the *Action Globale Innovante pour la Région (A.G.I.R.) pour l'énergie*, builds around a horizontal logic of intervention across sectors and stakeholders. It is suited to the needs of the region, highly legitimated by a wide participation of regional stakeholders, and innovative in the use of the intervention instruments that try to adapt to the capacities of the target groups. Additionally, it is closely and formally connected with national policies and framework agreements that ensure adequate institutional and financial support. The high transfer potential of the project was nevertheless constrained by its short implementation period that also partially affected the evidence of impact.

The third case study, *the City of Stockholm's Climate Initiatives*, is an example of comprehensive and systematic emission reduction efforts at the local level, which follow a long-term vision for LCE. It presents a highly coordinated approach involving the entire local administration, the business community and the local citizens, in the implementation of innovative, technology-based measures across a wide range of fields, such as district heating/cooling, carbon-

free transportation, energy efficiency in buildings, etc. It is based on wide political consensus, while benefiting from effective exchanges of experiences at the international level.

The fourth case study, *the Gloucester City Council Climate Change Strategy*, demonstrates how mobilisation of human resources, both within the administration and the community, can quickly lead to a decrease in carbon emissions in a small-sized local authority. It is a comprehensive, though short-term approach, which prioritises measures promoting changes in behavioural patterns, while leveraging private investments in LCE-related actions. The Strategy benefits from central government guidance on monitoring and reporting.

In Part 4, conclusions are drawn and recommendations on enabling framework conditions outlined, with a view to facilitating the transition of LRAs towards LCE.

1. Review of selection criteria for best local and regional practice in transition to low carbon energy

1.1 Introduction

The scope of this report is to identify a set of framework conditions facilitating the transition to LCE by LRAs. These conditions derive from the evidence of a few successful experiences by LRAs (Part 3). The level of success of these experiences is determined using a set of criteria for the identification of best practices, defined on the basis of a recent literature review (Part 1). The case study structure and methodology are described under Part 2. Finally, in Part 4 conclusions are drawn on the framework conditions, at EU and national level, which facilitate progress by LRAs towards LCE.

1.2 Literature review

There is a limited number of studies focussing on the definition, selection and/or benchmarking of energy-related best practice, the majority of these having been elaborated in the context of international awards or interregional cooperation projects. Thus, in order to determine the criteria for the identification of successful case studies, the scope of literature review was widened to include: criteria for awarding prizes in the energy sector; criteria for inclusion of successful cases/practices into databases; project deliverables, such as toolkits and indicators for measuring progress towards climate friendly development; and indexes. The review was organised according to the territorial level addressed (local/regional and national under 1.2.1 and 1.2.2, respectively) while 1.2.3 reports on those references related to other stakeholders than public authorities, i.e. the private sector and NGOs.

1.2.1 Local and regional level

The European Green Capital Award, aiming at promoting urban sustainability and the sharing of best practices between **cities**, applies an evaluation approach that uses quantitative indicators addressing ten environmental areas, including one with a direct focus on LCE issues, i.e. '*local contribution to global climate change*' (European Green Capital, 2010). The selection of indicators touches upon a set of three sustainability aspects: (i) state of the environment, to identify the 'greenest' city; (ii) (level of) implementation of efficient and innovative measures and future commitment; and (iii)

communication and networking (potential to inspire other cities and promote best practice). More precisely, the assessment of local policies and actions supporting LCE looks at CO₂ reduction efforts as well as at the actual increase in EE and in the use of RES. The relevant indicators used in the evaluation of the applicant cities are: CO₂ per capita and trends over the period 1990 - 2005; carbon content in electricity; (level of use of) district heating; and GHG reduction target.

Within the **pilot study ‘Promoting Energy Efficiency Best Practice in Cities’** (IEA & ICLEI, 2008), a ‘*set of criteria for evaluating energy efficiency case studies*’ was developed. Five criteria were used to undertake a quantitative evaluation of programmes; within each criterion, an ‘*arbitrary benchmark*’ was set to distinguish the programmes performing best. Criteria and benchmarks are summarised in Table 1.

Table 1 – IEA & ICLEI criteria for evaluating energy efficiency case studies

Criterion	Definition	Benchmark
<i>Implementation timeframe</i>	Time to deliver energy efficiency improvements, from the design stage to adoption/approval and implementation	12 months
<i>Energy savings</i>	Energy saved ‘with’ the measure/programme, compared to the ‘without’ scenario	20%
<i>GHG emission reductions</i>	CO ₂ e savings ‘with’ the measure/programme, compared to the ‘without’ scenario	20%
<i>Return on investment (ROI)</i>	Efficiency of the investment/programme measured over a 10-year period. Initial investment is discounted to the national long-term interest rate of the year of the investment; financial savings are discounted at the average national inflation rate calculated over a 10-year period	Break-even point at 10 years (ROI over 10 yrs = 0%)
<i>Transferability</i>	A three-level scale is applied: 1 - the programme cannot be transferred; 2 - transfer is possible but at a considerable cost; 3 - transfer is possible and inexpensive	

Source: [IEA & ICLEI \(2008\)](#)

The ManagEnergy initiative of the Intelligent Energy Europe (IEE) programme has developed a comprehensive set of criteria for the evaluation of projects nominated for the **2011 Local Energy Action Award** competition. The assessment system gives scores in three key areas, each having the same weight: (i) impacts and results; (ii) sustainability of the action; and (iii) level of

replicability. The actual evaluation considers a large number of quantitative and qualitative indicators, summarised below (ManagEnergy, 2010):

- (i) *Impacts and results (as a direct project outcome)*: expected savings in energy consumption and CO₂ emissions; expected energy produced from renewable sources by 2020; credibility of the methodology for quantifying and monitoring the impacts and results; other benefits such as job creation, investment mobilised, increase of competitiveness, persons trained, visibility (media impact), audience reached, participation rate etc.
- (ii) *Sustainability of the action*: continuity of funding, operations, etc., after the end of the project; social and political acceptance of the solutions developed as indicated by the active involvement of local actors, positive feedbacks collected, local follow-up activities originated from the original initiative, etc.
- (iii) *Replication potential*: relevance of the solutions developed for other communities; adaptability to different contexts.

The Regions for Sustainable Change project has developed an **indicators toolkit ‘for measuring climate-friendly economic development’ at the regional level**. The toolkit was created to support the use of the [Regional Climate Confidence Index](#) (RCCI), i.e. an index assessing the capacity of regions to promote LCE. The RCCI facilitates comparison between different regions and supports broader benchmarking, using EU averages. It is measured through quantitative and qualitative indicators from six thematic areas (Regions for Sustainable Change project, 2011a and 2011b):

1. GHG emissions: GHG emissions per capita and per Gross Domestic Product (GDP) (intensity)
2. Sustainable energy use: Final Energy Consumption (FEC) per capita; intensity of Final Energy Consumption (FEC/GDP); RES in FEC.
3. Policy framework: comprehensive climate change (CC) strategy and/or action plan; integration of CC into a sectoral policy framework; quantified and measurable CC mitigation targets; assessment of vulnerability to CC and the integration of CC adaptation in policies.
4. Institutional set-up and capacity: dedicated administrative unit to manage CC; financial means available to institutions to manage CC; regulatory mandate; access to research capacity and technical information.

5. Socio-political awareness: priority to CC on the regional political agenda; political leadership on CC and low carbon economy; business sector outreach with regard to climate friendly, low carbon actions and activities; overall public support for the development of a carbon friendly economy.
6. Financial aspects: availability and use of financial instruments and other incentives to support and encourage climate-related actions; the extent of integration of CC into the planning, programming and implementation of regional economic development programmes (including Cohesion Policy funding for 2007-2013).

1.2.2 Country level

With regard to the institutional framework, a **best-practice policy package** has been defined by WWF and ECOFYS with the support of the European Climate Foundation. The package provides an overview of **necessary conditions for moving towards LCE at country level**. Conditions are given by sector. For electricity supply, industry, building and transport, conditions are weighted under the three main pillars of ‘renewables’, ‘energy efficiency’ and ‘overarching’ (Table 2).

Table 2 –WWF & ECOFYS best-practice policy package

Sector	Conditions		
<i>General</i>	binding GHG target or budget, supported by a strategy for LCE, including resources for research and development		
	Renewables	Energy	efficiency
	Overarching		
<i>Electricity Supply</i>	60%: sufficient support, without grid administrative barriers	20%: sufficient support to combined heat and power	20%: performance standards for fossil fuels power plants; no incentives/subsidies for fossil fuels energy; incentives for biomass carbon capture and storage
<i>Industry</i>	25%: effective support, facilitating breakthrough of innovative technologies	25%: support schemes or voluntary agreements towards energy efficiency	50%: supporting energy gains along the life cycle of products; incentives for biomass carbon capture and storage; energy taxes
<i>Buildings</i>	25%: promoting heating/ cooling from renewables	65%: establishing efficiency standards; incentives for building renovation and use of efficient appliances; removing administrative barriers; enforcing standards	10%: energy taxes for households and the service sector
<i>Transport</i>	30%: incentives to increase the share of renewables as energy sources	50%: reducing vehicle emissions	20%: supporting modal shift and motivating energy savings and use of renewables
	Common	Individual	
<i>Agriculture</i>	Consistent and comprehensive land use strategy	Reducing nitrogen load/ha and methane emissions from animals; promoting sustainable farming practices	
<i>Forestry</i>		Sustainable forest planning and management	

Source: [WWF & ECOFYS \(2010\)](#)

The **European Bank for Reconstruction and Development (EBRD)** developed the **Index of Sustainable Energy (ISE)**, a composite index facilitating country-level benchmarking of progress in reforming the energy sector towards improved sustainability. The ISE targets **transition countries** and focuses on three key areas: EE, RE, and CC. The index measures the capacity of relevant country institutions to promote the efficient use of energy and RES (for example by assessing the existence of market incentives), as well as the level of general outcomes in terms of CC-related emissions (EBRD, 2010a and 2010b).

PriceWaterHouseCoopers (PwC) introduced the **Low Carbon Economy Index** to rank **countries** on the basis of their achievements towards LCE. The index is built around two sub-indices: (i) the PwC Low Carbon Achievement (LCA) Index, used to assess the level of progress countries have made during the last 100 years in reducing the carbon intensity of their economies (ratio of energy-related CO₂ emissions to GDP); and (ii) the PwC Low Carbon Challenge (LCC) Index, used to assess the ‘*distance to go*’ for countries in reducing their carbon intensity to benchmark levels (required carbon intensity reduction until 2050, in order to achieve the estimated global carbon budget necessary to limit warming to two degrees) (PwC, 2009).

According to the World Bank’s **Low Carbon Growth Country Studies Programme**, options for low carbon intervention need to be ranked against some criteria that for Mexico, for example, were identified to include: (i) *CO₂ emission reduction potential*; (ii) *low cost per ton of CO₂e reduced*; and (iii) *feasibility of implementation* (The World Bank, 2009).

1.2.3 Other important references

From the business sector

The German Energy Agency (DENA - Deutsche Energie-Agentur GmbH) organises an annual award focusing on increasing energy efficiency in industry and production. The approach is business oriented; however, the assessment of the projects is undertaken by a jury comprising experts not only from business and science, but also from policy makers. DENA introduces a set of five criteria for the assessment of projects competing for the 2011 Energy Efficiency Award⁴: (i) energy saved; (ii) economic viability; (iii) level of innovation; (iv) potential to be transferred (transferability to other businesses); and (v) impact on the environment/environmental effect, especially as regards climate protection (DENA, 2011).

From NGOs

The International Network for Sustainable Energy (INFORSE) Europe manages the Case Study Database of European examples of good practice in sustainable energy.⁵ Compliance with the INFORSE database standards requires the submission of a description of the ‘best practice’ using a template that includes the following elements: overview, organisation(s) initiating the project, developments and current situation, economy (investment, funding, costs,

⁴ <http://www.enr-network.org/energy-efficiency-award-2011.html>

⁵ INFORSE is a network of independent non-governmental organisations.

savings), technical aspects (description, quantification of energy consumption and savings), links with EU policies and targets.⁶

From topic-specific cases

Within the REQUEST project, best practices on the uptake of Energy Performance Certificates (EPC) are selected on the basis of the following criteria (REQUEST, 2011): (i) clearly addressing EPC recommendations ‘*beyond audit and design*’; (ii) evidence of appreciation by target groups; (iii) availability of implementation indicators; and (iv) level of networking between the different actors in the supply chain, measured through the number of stakeholders’ groups involved. Criteria for the selection of best practices on ‘*quality in the supply chain*’ include: (i) focus on the implementation stage; (ii) level of dealing with voluntary or mandatory requirements related to people/products/inspections; (iii) compliance with standard requirements; (iv) quality level of work undertaken; (v) appreciation by target groups; and (vi) inclusion of mechanisms for communicating with/informing the customer.

1.3 Analysis of the findings of the literature review and proposed criteria for the identification of best practice

The transition to LCE economy cuts across several sectors, in particular those contributing the most to energy consumption and GHG emissions (industry, transport, buildings, agriculture, etc.); hence, it is frequent to find criteria for sector-specific best practices, for example in the case of smart buildings, rather than for LCE development pathways as a whole. Nevertheless, drawing on the review under 1.2 and taking into account the scope of the report, it is considered appropriate to base the identification of best practices on a three-tier approach, as follows:

Tier 1 – Exclusion criteria

Availability of information required to make a full assessment of the practice, using indicators addressing the main selection criteria (Tier 2).

⁶ The full template is downloadable from http://www.inforse.dk/europe/success/SU_About.htm.

Tier 2 – Main selection criteria

- 1 **Level of interaction with supportive regional/local policies, strategies and institutional settings for LCE development.** The following aspects are considered under this criterion: the prioritisation (importance) of LCE in regional development; the type of measures fostering EE and/or increased use of RES; the existence of objectives and/or (binding) targets; the level of integrated approach of LCE pathway across the different sectors; the existence of a medium- to long-term vision beyond the election period; clearly attributed responsibilities among relevant stakeholders or presence of regulatory mandates (i.e. local or regional energy agencies); partnering and networking across relevant stakeholders.
- 2 **Impact and results of the programme/project.** This criterion implies the existence of an accounting and/or monitoring system within the programme/project, able to detect one or more of the following quantitative or qualitative indicators: changes and/or trends in GHG emissions (e.g. CO₂ per capita or per GDP), overall energy consumption, and the carbon content of the energy used (e.g. carbon content in electricity, percentage of RES in overall energy consumption, etc.); changes and/or trends in energy savings and energy efficiency improvements as compared to a ‘business as usual’ scenario. Issues of credibility of the methodology used to monitor results are also raised in this respect. The impact may also be referred to other areas such as: economy (business development, increase of competitiveness, job creation); and social development (capacity building, awareness raising, civil society participation).
- 3 **Sustainability of the programme/project.** This criterion implies the existence of quantitative information on the economic viability of the programme/project. Additionally, it also refers to other sustainability aspects such as the assessment of the appropriateness of the institutional framework or of the level of appreciation of the programme/project by target groups.
- 4 **Existence of clear linkages with national and/or EU frameworks,** including legal provisions, policies, targets, financial support, and capacity building. This criterion addresses the need to directly focus on the scope of the report, i.e. to identify a set of framework conditions at the national and EU level facilitating the transition to LCE by LRAs.

A certain level of flexibility is expected on the type of information/measurable indicators available under each criterion. In particular, the wide range of indicators that have been considered under each criterion are not meant to be

applied and measured simultaneously; rather, their use will be subject to the type of information available and the relevance of the best practice assessed.

Tier 3 – Additional criteria (reflecting an added value of the practice)

The third tier includes criteria that are important but that will not be considered binding in the selection of the programme/project to be described. These criteria, adding value to the practice, include: (i) the potential to be replicated and transferred to other LRAs; and (ii) the innovative character of the approach fostered or of specific elements of the practice.

2. Case study structure and methodology

Further to the definition of the criteria for the identification of successful experiences by LRAs towards LCE (Part 1), the second part of the report focuses on the outline of a single structure for the description of four such experiences (2.1) and on the selection methodology (2.2).

The use of a specific structure has the twofold aim of: (i) guiding the collection of information on the relevant aspects of each case with respect to the selection criteria (Tier 2); and (ii) providing a common framework that facilitates the assessment of achievements and the drawing of recommendations on requirements and preconditions facilitating the transition to LCE by LRAs.

2.1 Case study structure

The proposed structure is presented and commented below. It is organised around ten sections.

1. Country code	2. Title of the programme/project
-----------------	-----------------------------------

The country code provides an immediate, although broad, localisation of the case study.

The title of the programme/project is the one attributed by the implementing authority in the case study-related literature.

3. Status	On-going		Completed		Follow-up foreseen	
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The status indicates whether the programme/project is still on-going or not. Where the programme/project has already been completed, it is further specified if follow-up has been planned/implemented since completion.

4. Synopsis	Summary of the main characteristics of the programme/project
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The synopsis provides a brief description of the case study. It highlights the type of programme/project, key achievements and main reasons for success of the initiative, using bullets points.

5. Implementing authority

Name and role of the implementing LRA

The name of the local or regional authority implementing the programme/project is specified and a description of the authority's leading role within the initiative is provided.

6. Other relevant stakeholders

Name and role of other institutional and/or relevant stakeholders

Stakeholders playing an active and/or institutional role within the programme/project are specified under this section, and their function within the initiative is concisely explained.

7. Background

Starting conditions and environment

This section provides the overall baseline context of the initiative, highlighting the path leading to the kick-off of the programme/project.

8. Description of the programme/project

8.1 Regional/local policies, strategies and institutional settings for LCE development

8.2 Impact and results

8.3 Sustainability (and funding)

8.4 Linkages with national and/or EU frameworks

This section includes the description of the programme/project structured against the selection criteria of the case study. In particular, sub-sections 8.1 to 8.4 focus on:

1. The role of LCE in regional development; prevailing types of measures in the fostering of LCE; objectives and/or binding targets; the integration of LCE pathway across sectors; the nature of the vision; partnering and networking.

2. Quantitative and/or qualitative indicators used to assess the achievements and impact of the programme/project; the methodology used to monitor progress and results.
3. The economic and/or institutional viability of the programme/project; the level of appreciation of the programme/project by target groups. Funding arrangements are described under this sub-section.
4. National and/or EU framework conditions that have in the past supported, or are currently supporting the programme/project. Particular attention is given to the following areas: legal provisions, policies, targets, financial support, and capacity building.

9. Analysis

9.1 Assessment of achievements

9.2 Success factors

This section includes an analysis of the information previously presented. In particular: sub-section 9.1 reports on the comparison of the information contained in 8.2 and 8.3 (tangible and intangible achievements) with the information under 8.1 (planning, objectives and targets); while sub-section 9.2 highlights the conditions leading to the success of the programme/project. The outlining of the conditions leading to the success of the initiatives, particularly with regard to the national/EU framework, provides valuable input towards (i) drawing conclusions over the impact of multi-level interaction and (ii) making recommendations for change, which can facilitate LRAs' path towards LCE.

10. References

Consulted literature and further reading

This section lists all consulted literature and makes available the links to relevant websites and documents that provide the reader with additional information.

2.2 Case study selection methodology

2.2.1 Criteria

The main criteria applied for the selection of relevant case studies include: (i) availability of information, as per tier 1 (see 3.1); selection criteria, as per tier 2 (see 3.1); and geographical balance.

The quality of each case was characterised according to the level of compliance with the criteria of tiers 1 and 2. ‘Unsatisfactory quality’ characterised cases that are not sufficiently explained and/or do not cover one of the selection criteria such as, for example, the existence of clear linkages with national and/or EU frameworks or the availability of results. ‘Adequate quality’ characterised cases that are sufficiently explained and are likely to meet all tier 2 criteria, although to different extents. ‘Good quality’ characterised cases that are well explained, evidently meet all tier 2 criteria to a certain extent and, in particular, are integrated across sectors, provide for clear results and have linkages with national and/or EU frameworks. Moreover, ‘good quality’ practices either include an innovative element and/or tools that facilitate replication (tier 3 criteria).

A matrix was created (Table 3) containing the identification number of the practice, the country reference, the implementation level (local (L) and/or regional (R)), and the criteria outlined under the three tiers. One last row at the end of the table reports on the result of the selection process.

Table 3 - Template of the selection matrix

Identification Number	1	2	3	4	5	6	7	8	...	
Geographical reference (country code)										
Local (L) and/or Regional (R) Authority										
Tier 1										
Availability of information										
Tier 2										
1. Level of interaction										
LCE in regional development										
Measures fostering EE										
Measures supporting RES										
Other measures										
Existence of objectives										
Existence of targets										
Integrated LCE pathways across different sectors										
Medium- to long-term vision										
Clear responsibilities/ mandates										
Partnering and networking among stakeholders										
2. Impact and Results										
Existence of an accounting and/or monitoring system										
Existence of quantitative indicators/results										
Existence of qualitative indicators/results										
Credibility of the methodology used to monitor results										
Socio-economic or other impacts										
3. Sustainability										
Quantitative information on the economic viability										
Other aspects of sustainability										
Appreciation of the programme/project by target groups										
4. Linkages										
With national and/or EU frameworks										
Tier 3										
Replication potential										
Innovative character										
Result of the selection (-) unsatisfactory quality (+) adequate quality (++) good quality										

2.2.2 Selection process

In total, more than 40 potential cases were screened but only 29 cases had sufficient information to undertake a preliminary assessment; of these 29 cases, four were selected as ‘good quality’ cases and twelve as ‘adequate quality’ cases. A brief outline of strong and weak aspects of these good and adequate cases is reported in Table 4.⁷

Table 4 – Strengths and weaknesses of ‘good quality’ and ‘adequate quality’ cases

Identification number ⁸	
Good quality cases	
14	<p><i>Strengths:</i> Regional medium- to long-term energy strategy; clear objectives and targets; strong political support; different types of measures (EE, RE, etc.); clear allocation of responsibilities; innovative character of some of the components (eco-energy); networking and clustering; achievement of concrete results; positive impact on socio-economic areas.</p> <p><i>Weaknesses:</i> Presence of a dedicated monitoring and accounting system need to be clarified.</p>
17	<p><i>Strengths:</i> Participative approach clearly linked to regional development; various measures considered (EE, RE, etc.); target groups include both the public and the private sector; tackling replication; clear linkage to EU financial support (ERDF).</p> <p><i>Weaknesses:</i> The assessment of the outputs is constrained by the absence of targets.</p>
24	<p><i>Strengths:</i> Clear long-term vision and short-/medium-term objectives; integrated LCE approach addressing multiple sectors; clear allocation of responsibilities; emphasis on monitoring results; sufficient indicators/results/impact; sustainability aspects considered; in line with national EU policies; includes innovative elements</p> <p><i>Weaknesses:</i> Integration with regional plans not clear; synergies with national level actions need to be further clarified.</p>
25	<p><i>Strengths:</i> Integration with regional and national plans; implementation of a wide range of measures (EE, RE, etc.); clear targets and objectives; clear allocation of responsibilities; good networking and partnering with stakeholders; annual monitoring and accounting; high appreciation by target groups; clear linkages with the national level; includes innovative elements.</p> <p><i>Weaknesses:</i> Some indicators/results imply limited improvement in emission levels for specific years (though overall the impact of the plan is positive).</p>

⁷ The four good quality cases satisfy the necessary geographical balance and address both local and regional initiatives; thus, they are prioritised for further description under Part 3 of the report.

⁸ As per Appendix I.

Adequate quality cases	
2	<p><i>Strengths:</i> Comprehensive approach across sectors and policy areas; several information available; concrete results achieved; innovative character of some of the initiatives (such as the train of ideas); appreciated by target groups.</p> <p><i>Weaknesses:</i> It is not an individual programme but the culmination of several interventions by the municipality in the last 5-10 years; it does not focus solely on LCE.</p>
3	<p><i>Strengths:</i> Comprehensive strategy; clear targets, objectives and measures.</p> <p><i>Weaknesses:</i> Concrete results are available only for one component of the strategy (RE-FIT, see case 31); limited information available for the other components; unclear linkages with national framework conditions; unclear existence of an accounting/monitoring system.</p>
4	<p><i>Strengths:</i> Voluntary initiative to reduce the carbon footprint of the inter-municipal association LIPOR; achievement of concrete results; monitoring system in place; social impact through education and awareness initiatives.</p> <p><i>Weaknesses:</i> Sector-specific strategy (waste) focussing only on energy efficiency measures; unclear linkages with national/EU frameworks.</p>
6	<p><i>Strengths:</i> Comprehensive approach across sectors; medium- to long-term strategies; clear objectives; clear allocation of responsibilities.</p> <p><i>Weaknesses:</i> Only partial results available (up to 2006); unclear linkages with national/EU frameworks; unclear existence of an accounting system.</p>
8	<p><i>Strengths:</i> Involving regional and local authorities as well as the private sector; business-oriented; liaising with EU-funded research initiatives.</p> <p><i>Weaknesses:</i> Sector-specific project (transport) focussing on one renewable energy source (biogas); business development overarches environmental concerns.</p>
15	<p><i>Strengths:</i> Voluntary scheme falling within the regional Framework Plan for Climate Change Mitigation 2008-2012; addressing public and private stakeholders; achievement of concrete results; existence of a monitoring system; innovative approach.</p> <p><i>Weaknesses:</i> Results of the individual performance of companies adhering to the scheme do not seem to be publicly available. Missing information on sustainable aspects.</p>
18	<p><i>Strengths:</i> Encompassing different types of measures (EE, RE, etc.); clear linkages with EU support; existence of an accounting/monitoring system.</p> <p><i>Weaknesses:</i> Very small scale of implementation (village level), intended to become a demonstration initiative. Unclear linkages with regional development; lack of vision or medium- to long-term strategy. Unclear sustainability.</p>
19	<p><i>Strengths:</i> Clear medium- to long-term vision; solid targets and objectives; existence of a monitoring system, including annual reporting of results; clear quantitative indicators; positive impact on job creation and local economy; economic viability considered; high appreciation by target groups; clear linkages with national policy; good replication potential; includes innovative elements.</p> <p><i>Weaknesses:</i> Allocation of responsibilities/mandates not sufficiently described; reporting of results not yet available.</p>

26	<p><i>Strengths:</i> Clear medium- to long-term vision; solid targets and objectives; implementation of a wide range of measures (EE, RE, etc.); existence of a monitoring system; clear qualitative indicators; clear linkages with national policy; includes innovative elements.</p> <p><i>Weaknesses:</i> Limited availability of actual results; monitoring methodology based on model estimations of past data; appreciation of the programme by target groups not clear.</p>
27	<p><i>Strengths:</i> Clear medium- to long-term vision; solid targets and objectives; clear indicators and results; clear linkages with national policy; good replication potential; includes innovative elements.</p> <p><i>Weaknesses:</i> Limited focus on integrated LCE pathways across different sectors; limited information about sustainability.</p>
28	<p><i>Strengths:</i> Implementation of a wide range of measures (EE, RE, etc.); clear objectives; clear allocation of responsibilities; good networking and partnering with stakeholders; adequate linkages with the national level.</p> <p><i>Weaknesses:</i> Links with regional development not explicit; monitoring system not sufficiently described.</p>
29	<p><i>Strengths:</i> Implementation of a wide range of measures (EE, RE, etc.); clear allocation of responsibilities; good networking and partnering with stakeholders; high appreciation by target groups; clear linkages with the national level</p> <p><i>Weaknesses:</i> Links with regional development not explicit; medium-/long-term vision and objectives not clear.</p>

3. Selected case studies

3.1 AT - Energy 21: the 2nd phase of the Upper Austrian Energy Concept

3.1.1 Status

The implementation of the action plan of the regional energy strategy of Upper Austria, 'Energy 21', was completed in 2010. In 2007, the regional government adopted the 'Energy Future 2030' strategy, tackling even more ambitious targets and including some 148 concrete measures to achieve them. The Energy Future 2030 started being implemented in 2010 as a follow-up to Energy 21.

3.1.2 Synopsis

- ▶▶ Energy 21 is both a strategic concept and an action plan encompassing 25 concrete measures to achieve energy savings and an increased use of RES. It covered a 10-year period (2000-2010), bridging the first Upper Austria Energy Concept (1994-2000) to the Energy Future 2030 (2010-2030).
- ▶▶ Energy 21 has achieved all its objectives. Implementation was successful and several of the targets were reached earlier than planned.
- ▶▶ Achievements include: more than doubling the energy production from renewable sources; more than doubling biomass heating; generating 6.4% of electricity from renewable sources, excluding hydro power; installing over one million m² of thermal solar collectors; increasing industry-related energy efficiency (EE) by 14%; and reducing energy consumption in public buildings by 29%. Additionally, energy-related business development was substantially strengthened and 1,500 new 'green' jobs created.
- ▶▶ Energy 21 is a good example of a well-structured, medium- to long-term regional policy for green energy development through a combination of legal instruments, financial incentives and comprehensive communication and training initiatives. Its success is due to a strong political will, clear allocation of implementation and management responsibilities, the pro-active involvement of businesses, the simultaneous targeting of private and public stakeholders, intensive information and education initiatives, and an effective integration of EE and RES measures.

3.1.3 Implementing authorities

Since the mid-1990s, the Upper Austrian Government has played a strategic role in developing and ratifying coherent energy strategies, each building on the success of the previous one. Besides providing a well-defined and uninterrupted policy framework for green energy and EE, the regional authority is also responsible for a supportive fiscal policy towards the development of a LCE (B. 1).

Responsibility for the implementation of the Energy 21 is with the *O.Ö. Energiesparverband* (ESV), the Energy Agency of Upper Austria. The agency was established by the regional government in 1991. It deals with all energy-related matters and is specifically responsible for: information and awareness-raising; advisory services to businesses, local authorities and private households; training and education; supporting and/or managing regional programmes; leading sustainable energy events; and cooperating with national, European and international energy institutions, including within the framework of various projects and programmes (O.Ö. Energiesparverband, 2011). In addition, on behalf of the regional government, ESV manages ‘*a fund for energy performance contracting for energy efficiency and renewable energy investments*’.⁹

3.1.4 Other relevant stakeholders

One of the measures of Energy 21 implied the establishment of the *Oekoenergie-Cluster* (OEC) in 2000; this is a regional network of green energy businesses that contributed to the implementation of other Energy 21 measures (European Cluster Observatory Case Study, 2008). OEC is managed by the ESV and is financially supported by regional funds from the ‘*Innovatives OÖ 2010plus*’ programme. The cluster has the aim to ‘*foster innovation and competitiveness of green energy businesses and thereby to contribute to a positive market trend in the field of sustainable energy production and use*’ (Oekoenergie-Cluster, 2011). In particular, OEC tasks relate to: information, communication, public relations and networking; training, technology transfer and cooperation; research and development (R&D); marketing and exporting. As of January 2011, 154 companies and organisations from the region and 41 companies from South Bohemia were partners to the cluster, with an overall turnover of 1,700 million EUR (Oekoenergie-Cluster, 2011). In 2004, the cluster received the EU award for RES (European Cluster Observatory Case Study, 2008). In 2006, the manager of OEC was awarded the first European Cluster

⁹ O.Ö. Energiesparverband [web site](#), accessed November 2011.

Award by the European Commission (EC), established to honour ‘clusterpreneurs’ having significantly contributed to successful clusters.¹⁰

Although not specifically referred to the implementation of Energy 21, regional authorities also looked for the involvement of civil society in the development path towards environmentally friendly energy and CC policies. Indeed, in February 2005, a ‘Climate Pact’ was signed between the regional government and NGOs to tackle: (i) the phasing out of fossil fuels for heating; (ii) the production of green electricity; (iii) the doubling of the share of bio products in agriculture by 2009; (iv) the decrease of transport-related emissions; (v) the strengthening of regional structures; and (vi) information and awareness of consumers (Anschober R., 2009).

3.1.5 Background

Upper Austria has developed a clear policy framework for energy since the mid-1990s. The first regional energy strategy (or ‘concept’) adopted in 1993 covered the period 1994-1999; among other achievements, its implementation led to the increase of the share of renewable energy sources from 25 to 30% and to the reduction of energy consumption of private households by 30%. In 2000, building on the success of the first phase, a second phase of the Upper Austrian energy concept, ‘Energy 21’, was passed by the regional government to cover the period 2000-2010. In addition, in 2004, Energy 21 was complemented by the regional energy efficiency strategy ‘Energy Star 2010’ whose programme focussed on an annual increase of energy efficiency by 1% in the region and by 1.5% for public buildings by 2010.

In 2007, the approval of the ‘Energy Future 2030’ strategy, and within this strategy of the most ambitious ‘turning point scenario’ foreseeing the largest energy consumption reductions, confirmed the strong commitment of the regional government towards green energy policies.¹¹

Upper Austria has received several acknowledgements along its low carbon development path. In particular, in 2002, Energy 21 was the winner of the Campaign for Take-Off award, acknowledging successful projects and initiatives promoting renewable energy across Europe.¹²

¹⁰ Europe INNOVA conference 2006 [web site](#), accessed November 2011.

¹¹ Energy Future 2030 targets include: 100% covering of electricity and space heating demand with RES; reducing heating demand by 39%; reducing fossil fuels for transport by 41%; and decreasing GHG emissions by 65% (Anschober R., 2011).

¹² Europa press release [IP/02/1821](#) of 09/12/2002, accessed November 2011.

3.1.6 Description of the programme/project

Objectives, targets and measures

The Energy 21 strategy focussed on four main areas of intervention: (i) improving EE; (ii) increasing the use of RES; (iii) relying on hydro power up to defined ecological limits; and (iv) decreasing the use of fossil fuels. Intervention was guided by means of an action plan including 25 measures aimed at reaching a defined set of goals. Goals are specified in Table 3.1 together with achieved results.

The 25 measures addressed private households and public stakeholders as well as businesses and institutions. Measures ranged from the establishment of new forms of financing for the implementation of EE interventions, to the improvement of heating technologies, the setting of energy requirements for renovated or new buildings, the inclusion of energy indicators in public building-related procurement, the consideration of external costs in the investment decision-making process, the introduction/strengthening of energy accounting, and the provision of advice to local authorities on energy planning. The latter was translated into the ‘Energy concept for municipalities’ (E-GEM) programme where the development and implementation of ‘local energy concepts’ around some main objectives¹³ was supported, including in financial terms (i.e. up to 20,000 EUR per application).¹⁴

Other measures of Energy 21 directly tackled the increased use of RES, the generation of electricity from RES, Combined Heat and Power (CHP), and heat production from waste. Further, they pointed to the support of energy-related research; the support of the energy industry in terms of advice, funding and development and use of eco-efficient technologies and eco-designs; the establishment of voluntary agreements and of benchmarking; and the creation of the *Oekoenergie-Cluster*.

Impact and results

Quantitative indicators were used to assess achievements and the impact of Energy 21. Achievements are quantified in Table 3.1. They range from purely technical results to socio-economic impact in terms of creation of new jobs and opening of markets.

¹³ Namely: (i) reduction of energy consumption; (ii) use of regionally available renewable energy sources; (iii) regional and local value-added; (iv) contribution to climate protection; and (v) information and participation.

¹⁴ E-GEM [web page](#), accessed November 2011.

Table 3.1 – Energy 21 goals and achievements

Area	Goals	Achievements
RES	<ul style="list-style-type: none"> - Producing additional 10 PJ from renewable sources by 2010 - Doubling the share of biomass heating - Generating 3% of electricity from RES by 2005, excluding hydro power-generated electricity - Installing 1 million m² of thermal solar collectors by 2010 	<ul style="list-style-type: none"> - Energy production from renewable sources increased by 22.2 PJ - Biomass heating increased from 773 MW to 2,185 MW - The share of electricity from renewable sources, excluding hydro power, increased from 1% to 6.4% - Installed solar thermal collector surface area totalled 1,150,000 m²
EE	Increasing the industry sector EE by 10% by 2010	14% increase
Energy consumption	Reducing by 20% energy consumption for heating and hot water	Reduced by 29% for public buildings
Market and business development	<ul style="list-style-type: none"> - Establishing 30 new companies in the green energy market - Creating 1,500 new jobs 	<ul style="list-style-type: none"> - 85 new companies established in the fields of RES technology and EE; - about 1,500 new jobs created
Energy-related research	Launching an average of 15 RTD projects annually	An annual average of 20 RTD projects launched

Source: Land Oberösterreich, 2000 and 2011

ESV was in charge of monitoring and reporting progress towards the targets. Annual implementation reports are available beginning with 2003¹⁵; the final report, published in April 2011, includes the achievements of the Energy strategy as a whole (i.e. of ‘Energy 21’ and ‘Energy Star 2010’) according to the latest available data from Statistics Austria¹⁶ and in line with the calculation methods developed jointly by the federal and state governments, according to the European Energy Efficiency and Energy Services Directive 2006/32/EC (Land Oberösterreich, 2011).

Other monitoring instruments, already introduced in the early nineties, continued to be used during Energy 21: with regard to buildings, for example, an energy accounting system and energy guidelines were introduced to monitor the use of both EE and RE in public buildings; while an ‘energy performance indicator’ was used to assess whether the owners of private houses qualified for financial support towards construction or renovation (Egger C., 2009).

¹⁵ <http://www.esv.or.at/info-service/energie-in-ooe/energy-21/>, accessed November 2011.

¹⁶ www.statistik.at

B.1 Federal and regional frameworks for green energy funding

The federal government of Austria has been supportive in promoting renewables nationally through its taxation system. In 1996, an energy tax on the use of gas and electricity was introduced, applying to small-scale as well as industrial users, and part of the revenue was distributed to the regions and local governments to support EE and RE. In 1997, the Promotion Instrument for Electricity from Renewables (PIER) provided both a capital subsidy and a feed-in tariff for biomass, wind and solar electricity; feed-in tariff was extended to small hydro in 2002, within the framework of the Green Electricity Act and in compliance with the EU Renewables Directive. In 2009, the so called ‘15a Vereinbarungen’ or ‘[Agreement pursuant to Article 15a between the federal and state governments on measures in the building sector for the purpose of reducing GHG emissions](#)’, aimed at setting a country-wide joint approach with regard to building regulations. Along with regional funds, Federal funds contribute to subsidising biomass installations and biomass heating.

In Upper Austria, regional funding is for: renovation and construction of buildings complying with energy performance criteria; and subsidising solar thermal, biomass heating and geothermal in ‘*housing, commercially used and public buildings*’ for some 20-30% of the investment costs (Egger C., 2009). A ‘biomass fund’ has existed since 1993 to provide loans at attractive rates; in addition, support is provided for agricultural projects developing districts’ biomass heating plants. Upper Austria also relies on third party funding of energy saving measures and systems through Energy Services Companies (ESCO) and within the Energy Contracting Programme (ECP), covering public and business buildings as well as EE and RE measures, and providing subsidies to partially cover the investment by the ESCO.

Sources: Tindale S. (2010); Egger C. (2009).

Sustainability

Energy 21 emphasised the undertaking of promotional and advice activities for energy users (home owners, companies, housing associations and municipalities), increasing environmental awareness on the importance of EE and use of RES. Equally important was the undertaking of training programmes for energy advisers, installers and professionals, an investment that led to the ‘*availability of skilled personnel on different qualification levels along the value chain*’ (Egger C., 2009). Overall, behaviour change and skills’ enhancement contributed to making achievements sustainable over the time.

Funding and R&D programmes for companies offering RES products, such as the OEC network members, contributed to setting up a successful and dynamic market in the fields of EE and RES. The use of minimum requirements to be met to qualify for support facilitated the adaptation of businesses and the turn to an energy efficient system, as was the case for the construction industry for which a periodic tightening of energy thresholds was implemented (Egger C., 2009). This same approach of introducing minimum requirements for private owners to qualify for financial support (soft loans) from a regional housing programme contributed to further shaping the housing market.

Linkages with national and/or EU frameworks

The impact of green energy-related national regulations at the regional level is made evident in B.1. Additionally, Upper Austria receives substantial funding from the central level for the implementation of EE and RE policies, including Energy 21; in 2007, such funding amounted to some 20 million EUR or 23% of the total national funds made available to the nine regions through the UFI (*Umweltförderung im Inland*) funding scheme, a result that is considered to be ‘also due to the promotional activities carried out by ESV and the energy advice programme’ (Egger C., 2009).

Judging by the numerous EU-funded projects participated in by ESV, there is also evidence of a capacity on the part of the region to secure European funds within energy- and research-related programmes. In addition, Energy 21 was designed taking into account European guidelines and the climate protection targets of Austria (Land Oberösterreich, 2011).

Upper Austria plays an active role in the European context; it participates in EU programmes such as Interreg, the Alpine Space, Equal and Leader, while ESV coordinates and implements numerous EU-supported projects¹⁷, belongs to several European energy networks, such as FEDARENE, and is one of Europe’s largest energy advice and information providers.^{18,19}

3.1.7 Analysis

Assessment of achievements

The implementation of Energy 21 was successful; all targets were achieved and in most cases exceeded. Energy 21 proved to be a well-focussed strategy where

¹⁷ For example, in the framework of the Intelligent Energy Europe, FP and INNOVATION programmes.

¹⁸ European Commission, Upper Austria CORDIS [web page](#), accessed November 2011.

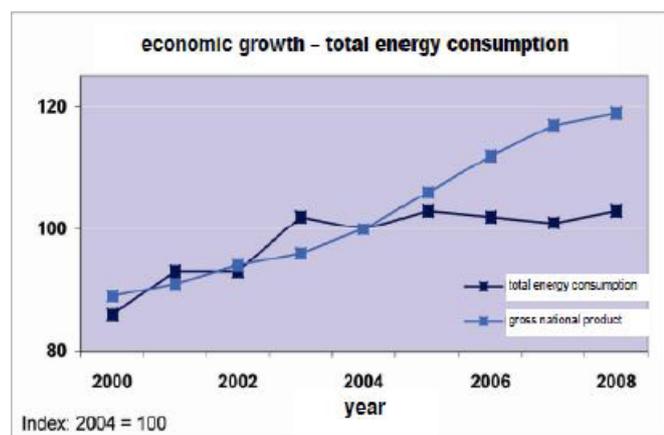
¹⁹ O.Ö. Energiesparverband [web page](#), accessed November 2011.

concrete and integrated measures resulted in an impressive share of RE in the region, i.e. 33.4% of the total primary energy demand in 2009.²⁰ An audit carried out in 2010/2011 by the Upper Austria Court (*LRH - Landesrechnungshof*) acknowledged the success of Energy 21 as well as the winning ‘structure’ or design of the concept (Land Oberösterreich, 2011). Finally, Energy 21 definitely contributed to the decoupling of energy consumption and economic growth since 2004, as shown in Figure 1.

Success factors

The success of the Upper Austrian energy strategy builds on the overall **high prioritisation of EE and RE by the regional government** and subsequent strong policy commitment. Other important factors at the governance level include a **very clear allocation of responsibilities** across existing institutions in terms of management, monitoring,

Figure 1 – Energy consumption and GDP



Source: extracted from Anschober R., 2011

implementation, and funding, with an added value given by the partnering and collaboration of regional authorities with the private sector and civil society. The development of OEC is an outstanding deliverable of Energy 21 and currently represents a self-standing success initiative across Europe.

The **design of the strategy** was also a success factor, developing around an **effective blending of three main components**: (i) **legal provisions** (e.g. installation requirements and obligations); (ii) **financial instruments** (e.g. investment grants); and (iii) **information activities and capacity building** (e.g. energy advice, training and education programmes). Such blending, if implemented over a sufficiently long period of time, allows for a coordinated creation of demand and supply of corresponding products and services (Egger C., 2009).

The fact of having set **quantitative targets** and implementing annual monitoring of progress allowed adjustments and calibration of intervention. **Stability of funding** and coherence in the proposition of financial instruments, including innovative ones such as the Energy Contracting Programme, contributed to the smooth deployment of Energy 21. Additionally, **links with**

²⁰ O.Ö. Energiesparverband [web page](#), accessed November 2011.

other policy sectors, besides energy and environment, increased **both political support and access to funding** sources, for example in the case of biomass heating that could access funds made available for agriculture.

The **impressive level of promotional activities** undertaken (including education, training, energy advice, and seminars) with respect to different target groups ranging from consumers and installers, to companies and decision-makers, ensured awareness and knowledge of measures, products, services, and, most importantly, benefits.

Finally, Upper Austria plays an active role at the EU level, participating in several projects and networks and thus enjoying a greater facility in accessing funding, knowledge and networking/partnering resources.

3.1.8 References and further reading

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European Cluster Observatory Case Study (2008), [Eco-energy clustering efforts in Upper Austria](#)

Land Oberösterreich (2000), [Energy 21, 2. Phase des O.Ö. EnergieKonzeptes, Ein Aktionsplan für das neue jahrzehnt](#)

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Oekoenergie-Cluster (2011), [Upper Austria's Network of Green Energy and Energy Efficiency Businesses](#)

O.Ö. Energiesparverband (2011), [The Energy Agency of Upper Austria](#)

Tindale S. (2010), [Repowering Communities case study: Upper Austria](#)

3.2 FR - A.G.I.R pour l'énergie

3.2.1 Status

The *Action Globale Innovante pour la Région (A.G.I.R) pour l'énergie* (Regional Global Innovative Action for Energy) of the *Provence Alpes Côte d'Azur* (PACA) was launched in 2006 to cover a four-year period (2007-2010). Upon its completion, A.G.I.R. was renewed for the 2011-2014 period as 'A.G.I.R. Plus'.²¹

3.2.2 Synopsis

- ▶ A.G.I.R. is a 4-year (2007-2010) project intended to reinforce the voluntary-based energy concept of the PACA region and its commitment to foster sustainable development including through an increased use of RE and higher energy savings.
- ▶ The project was built within the regional policy framework for energy and environment and was closely coordinated with national policies and support. To adapt to the medium-term vision of these policies, on its completion A.G.I.R was extended to 2014, under the name of 'A.G.I.R. plus'.
- ▶ A.G.I.R. indirectly set targets by means of its 'calls for projects', as most of the calls were expected to receive 100 applications over the four years of implementation. In fact, the number of applications was lower; the limited implementation period also constrained the detection of changes in behaviour and processes (including at the socio-economic level) at the end of the project and, in 2010, information on energy savings and energy production from RES was available for only 25% of the implemented projects.
- ▶ Among the achievements are: launching of 21 calls for projects; supporting the design and implementation of some 600 projects; involving more than 100,000 citizens and 1,500 companies; saving an annual 14 million kWh of primary energy; producing an annual 11 million kWh of RE; and creating 50 new jobs. Additionally, through the projects implemented under the A.G.I.R. umbrella, a few businesses/professionals networks were created or strengthened, 75 municipalities mobilised and 700 people trained.

²¹ A.G.I.R. [web site](#).

- ▶ A.G.I.R. is an example of a territory-focussed approach aimed at forming green energy-related technologies, processes, collaboration, professionalism and awareness throughout the region. Its success is due to strong political support at regional and national level, secured sources of funding, and to the use of a flexible instrument to involve diverse target groups (i.e. calls for projects) and adapt to their capacities.

3.2.3 Implementing authorities

With the aim of reinforcing its voluntary-based energy concept, the PACA region designed the A.G.I.R. project to tackle, at the regional level, the development of RE and of energy savings measures (PACA, 2006). The *Service Energie, Déchets, Air et Technologies de l'Environnement* (SEDATE) of the Regional Council of PACA was in charge of project implementation. A Project Steering Committee including PACA and other regionally elected representatives was established (EURÉVAL, 2010). The region also created favourable conditions for the implementation of A.G.I.R. through the inclusion of the project within the Region-State CPER (*Contrat de Projets État-Region*)²² and the provision of financial support by means of the *Financement Régional pour l'Environnement et l'Énergie* (FREE), contributed by both the region and ADEME.

ADEME is the public agency, established in 1992, involved in the management and implementation of energy- and environment-related policies and funds, at the national and, through its 26 regional divisions, the regional level. In the context of A.G.I.R., ADEME mainly supported initiatives related to buildings construction and rehabilitation (e.g. of social housing) for increasing their energy efficiency (EE) and environmental quality (PACA, 2010). In addition, ADEME contributed to the FREE and took responsibility for the management of the European Regional Development Fund that was among the resources used for supporting the social housing component of A.G.I.R.²³

3.2.4 Other relevant stakeholders

The Regional Pole for Innovation and Supportive Economic Development (*Pole Régional d'Innovation et de Développement Economique Solidaire*, PRIDES) dedicated to Sustainable Mediterranean construction (*Bâtiment Durable Méditerranéen*, BDM) was created in 2008 within the framework of A.G.I.R.

²² CPER are individual engagements between the State and each of the French regions, setting framework policy and financial conditions for the implementation of a set of important projects. The last [CPER \(Contrat de Projets État-Région\)](#) covers the period 2007 – 2013, i.e. matching the programming period of ERDF and FSE..

²³ ADEME [web site](#).

and subsequently became directly involved in the implementation of the initiative. PRIDES-BDM is a network of stakeholders belonging to the construction sector (e.g. professionals, labour unions, training centres, and companies) and contributed to: (i) supporting construction projects, including the rehabilitation of social housing; (ii) providing training for trainees and professionals; and (iii) encouraging the development of supply chains for innovative ecological materials and technologies for greener production processes and energy saving with regard to the construction and renovation of buildings (PACA, 2010).

In general, a wide number of different public and private actors within the region was involved in implementation, including, for example, associations and networks dealing with the optimisation of energy management, and the Regional Institute for Environmental and Sustainable Development Education (*Institut Régional de Formation à l'Environnement et au Développement Durable*, IRFEDD) (PACA, 2010).

3.2.5 Background

The PACA region has been engaged in promoting sustainable development since 1998. In the framework of a voluntary-based regional policy, the region committed itself to create the conditions for a sustainable regional development, supporting environmental protection and the raising of environmental awareness²⁴. This voluntary engagement was strengthened, in 2005, by the 'Energie 2010' concept, focusing, among other environmental issues, on the development of RE and of a more efficient use of energy²⁵. Finally, in December 2006, the PACA region adopted the AGIR programme, to emphasise its energy strategy with innovative and transversal actions.²⁶

Since 2000, the State, the PACA region and ADEME have elaborated multi-year framework agreements (2000-2006 and 2007-2013), annexed to the CPER. In 2000, the FREE financial instrument was also established. These agreements focussed on addressing environmental concerns through a transversal and territorial approach. In particular, the 2007-2013 agreement put great emphasis on CC concerns and, as a consequence, prioritised the implementation of A.G.I.R. Over the same period, FREE was allocated 122 million EUR (64 million EUR from ADEME and 58 million EUR from PACA) for two main areas of intervention: (i) management of energy demand and development of

²⁴ PACA [web site](#).

²⁵ [ecologie-pratique.org](#) press release, 15 June 2005: [Energie 2010 : un Plan ambitieux pour la région PACA](#)

²⁶ Since the mid-1980s, the PACA region has been also directly involved in the conceptualisation and implementation of ITER, an international collaborative research project aimed at demonstrating the viability of producing commercial energy from fusion.

RE; and (ii) support to a local development based on sustainable use and consumption patterns. AGIR also became a key project in the framework of the PACA region-State engagement (CPER) 2007-2013.²⁷

3.2.6 Description of the project

Objectives, targets and measures

A.G.I.R. was meant to be characterised by: the implementation of concrete *Actions* towards the development of RE and energy saving measures; the use of a *Global* approach, comprehensive in terms of initiatives (from grants to awareness-raising) undertaken and stakeholders addressed (citizens, public and private sectors); the promotion of *Innovative* measures (e.g. technological solutions for processes or prizes for awareness-raising or behavioural change) to decrease energy consumption, increase renewable energy use and educate to sustainable energy solutions; and a region-wide implementation in order to promote the social, economic, and technological growth of the PACA *Region* towards sustainable development.

The main objectives of A.G.I.R. were (PACA, 2006):

- to create technical and economic processes for renewables (i.e. thermal solar, photovoltaic, wind and biomass);
- to develop research and innovation for environmentally sustainable buildings;
- to promote exemplarity on energy saving through projects targeting schools, commercial areas, social housing, and farms;
- to raise awareness on environmental and energy issues, including by supporting co-operation and partnering at the local level.

The main modality of intervention within A.G.I.R. was the '*calls for projects*'. Calls referred to six different axes of intervention: (i) AGIR with the territories; (ii) AGIR by example; (iii) AGIR with the industries; (iv) AGIR for the 21st century building; (v) AGIR for the future; and (vi) AGIR with the citizens²⁸. Project's holders were supported by professionals in the design and implementation of their initiatives, and contributed financially to the cost of the intervention (AGIR contribution was on average equal to 50% for two thirds of

²⁷ [Accord-Cadre État-Région-ADEME 2000-2006; Accord-Cadre État-Région-ADEME 2007-2013](#)

²⁸ FEDARENE best practice [web page](#).

the projects, and over 50% for the remaining third)²⁹. In general, the types of intervention related to knowledge development, change of practices, or implementation of works. Table 3.2 shows the measures addressed by the calls and the number of projects designed during the implementation of A.G.I.R., by axis.

Table 3.2 – A.G.I.R.: measures by axis

Axis	Calls for proposal for:	n° of projects
AGIR with the territories	<ul style="list-style-type: none"> - Energy demand management. - Biomass and wind energy production and use. - Eco-mobility. 	43
AGIR by example	<ul style="list-style-type: none"> - Exemplary farms with regard to energy, water and waste management. - Exemplary buildings. - Exemplary municipalities organising and implementing energy management programmes and development of local RES. - Environmental training and education. - Sustainable management of tourism activities, including in terms of performance of tourism-related buildings. - Exemplary businesses integrating Corporate Social and Environmental Responsibility within their development. - Rehabilitation of social and low-rent housing in terms of energy performance; - Involvement of Regional Internet Spaces for Citizens in eco-friendly initiatives, such as the use of less polluting and more energy efficient hardware and the correct management of Waste Electrical and Electronic Equipment (WEEE). 	214
AGIR with the industries	<ul style="list-style-type: none"> - Development of photovoltaic energy, with installations developed for a total capacity of 10 MWp and producing about 11,000 MWh per year. - Networking of professionals 	151

²⁹ [EURÉVAL \(2010\)](#)

AGIR for the 21 st century building	- Creation of the PRIDES-BDM.	16
AGIR for the future	- Cash prize 'AGIR for the energy' addressed at associations and SMEs. - PREMIO project for research related to the integrated and optimised management of local energy production and RES, designed in collaboration with CAPENERGIES ³⁰ . - Support to the activities of the Regional Institute for Environmental and Sustainable Development Education (IRFEDD).	8
AGIR with the citizens	Environmental education initiatives; eco-mobility for students; grants for renewable energies and education on sustainable energy solutions.	<i>not available</i>

Sources: EURÉVAL (2010), PACA (2009)

Impact and results

A.G.I.R. was designed to reinforce the path towards sustainable development and the deployment of energy measures at the regional level. Local climate plans and plans for energy performance in agriculture were supposed to extend and amplify the individual projects promoted by A.G.I.R. However, the transversal character of the initiatives and the short implementation period of the project did not lead to large scale achievements, even though A.G.I.R. did achieve the important objectives of involving a wide range of regional actors, from citizens to professionals and companies, and of raising their awareness on RE and energy saving future challenges.

Overall, A.G.I.R. (PACA, 2011):

- launched 21 calls for projects;
- supported the implementation of 600 projects;
- involved more than 100,000 citizens in the region;

³⁰ CAPENERGIES (www.capenergies.fr) is a cluster composed of more than 340 partners from the PACA region, Corsica and Monaco, working in the fields of energy and renewable energies research, production and supply.

- involved some 1,500 companies by fostering partnerships and cooperation;
- saved an annual 14 million kWh of primary energy, mostly from interventions on buildings, and produced an annual 11 million kWh from renewable energy³¹;
- created 50 new jobs.

Other important results were achieved in the context of the projects implemented under A.G.I.R, such as (PACA, 2011):

- The creation in 2008 of the PRIDES-BDM, the network dedicated to sustainable Mediterranean construction.
- Strong support to IRFEDD, as part of the A.G.I.R. educational and training-based calls, completing the training of more than 700 people from students to professionals.
- Support to municipalities to design concrete and mandatory actions to be implemented over a four-year period as part of their energy management policy: 75 municipalities were involved in this action.
- Research towards the creation of a decentralised energy structure in the region, integrating local energy production and development of RES with the challenge of reducing consumption peaks on the local electric power grid, thereby saving energy and reducing CO₂ emissions. This was done through the PREMIO project.
- Establishment of reference frameworks and/or criteria for an ex-ante assessment of the energy quality of each project under the different axes and calls (PACA, 2010).

A.G.I.R. was evaluated by an independent private firm, the *Centre Européen d'Expertise en Evaluation*, EURÉVAL. The evaluation analysed the actions implemented from 2007 to 2009, with the exception of the axis 'AGIR with the citizens'. The evaluation noted that the intervention strategy of the project could have been improved by referring to medium-term rather than short-term objectives; and that the transversal approach across sectors suffered from the lack of provision of adequate technical expertise in areas of intervention other

³¹ Quantification of energy production and saving is from one fourth of AGIR implemented projects (PACA, 2010).

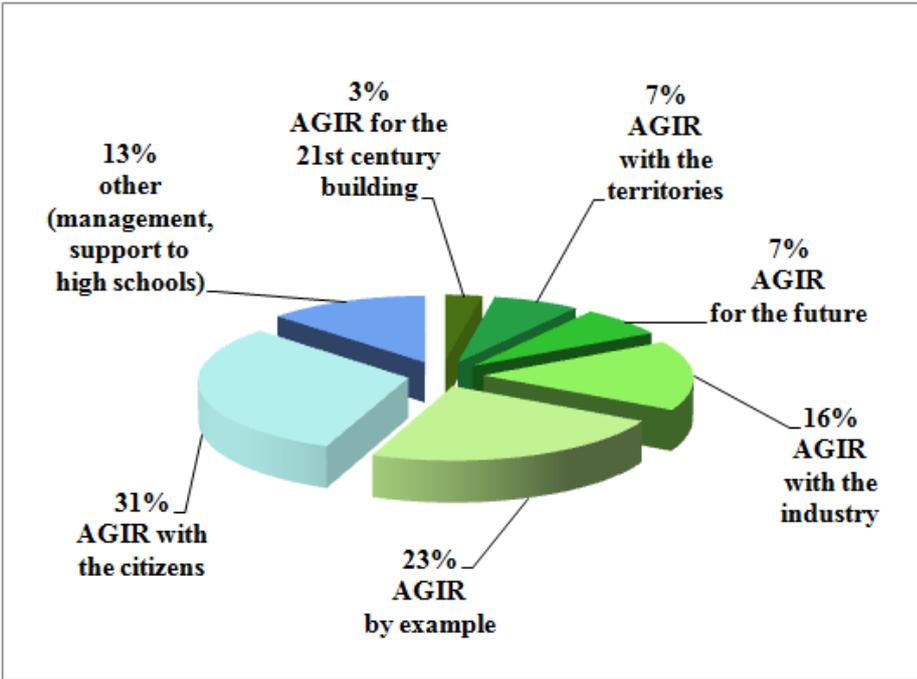
than energy. Finally, the project was found weak in terms of communication, dissemination and measurement of the impact (EUREVAL, 2010).

Sustainability

The project had strong political support, which in turn assured the financial backing and the will to extend it into a second phase (A.G.I.R. plus), including on the basis of the framework agreements with the State and ADEME.

A.G.I.R. was allocated 70 million EUR of regional funds over the period 2007-2010; 44 million EUR were disbursed from 2007 to 2009 (see Figure 2 for the allocation of funds among the different axes). However, the project also benefitted from ERDF funding (8 million EUR for the social housing component) and private funding (some 150-200 million EUR).³²

Figure 2 – AGIR budget 2007-2009 per axis of intervention



Source: EURÉVAL, 2010

A.G.I.R. put emphasis on education and awareness-raising as well as networking and partnering. However, it was not possible to assess whether the impact of the project was going to be sustainable in terms of collaboration mechanisms among relevant actors and behaviour

change, due to its limited implementation period.

Linkages with national and/or EU frameworks

AGIR was designed to amplify the voluntary-based PACA strategy conceived to manage energy issues but, after 2000, this strategy was also closely linked to

³² FEDARENE best practice [web page](#).

national policies by means of the framework agreements signed by the Region, the State and ADEME towards a common supportive policy framework for the measures defined in the CPER, among which was A.G.I.R.³³

In 2007, the national government launched its Environment Round Table (*La Grenelle de l'Environnement*), a participative process that led to the adoption of two main environmental laws at the national level: *Loi Grenelle 1*, in 2009, and *Loi Grenelle 2*, in 2010³⁴. In 2009, the PACA region signed a Region-State agreement on the coordination of sustainable development policies and the implementation at regional level of *La Grenelle de l'Environnement* (PACA-State convention, 2009). These additional national and regional joint commitments created favourable conditions for the extension of the A.G.I.R. into AGIR Plus.

3.2.7 Analysis

Assessment of achievements

The evaluation of A.G.I.R. concluded that the project represented a good response to the needs of the territory and that it satisfactorily complied with the priority concerns of the Regional Council, in particular the one related to the region's lagging behind in terms of use of RE (EURÉVAL, 2010).

The project did not set quantitative or qualitative targets at its inception but expectations on the level of involvement of target groups were indirectly built into the 'calls for projects', as most of the calls referred, in their title, to 100 applications over the four years of implementation. Response was lower, most probably due to the constraints imposed by the short implementation period; the latter also affected the impact in terms of changes in behaviour and processes as well as of energy savings and energy production from RES. Certainly, the project contributed to an increase in the energy-related knowledge and/or competencies of the target groups.

Success factors

Strong political support, first at the regional and later also at the national level, ensured a **high** level of **acceptability** of the project. Its **regional ownership** was also strengthened by the creation of a Steering Committee that included representatives of elected stakeholders across the region.

³³ [Accord-Cadre État-Région-ADEME 2000-2006; Accord-Cadre État-Région-ADEME 2007-2013](#)

³⁴ *La Grenelle de l'Environnement* [web page](#).

The project was design to complement other sustainable development policies such as Agenda 21. It was able to develop a **horizontal logic of intervention** that helped **strengthen consistency across different sectoral policies and raise awareness among the functionaries** of the various regional departments that started using cross-compliance criteria in management and investment decisions.

The project tackled innovation not only in technologies but also in methods. Its ‘calls for proposals’ structure made implementation dynamic and **able to adapt to the capacities of the target groups**, as each project holder was individually supported by professionals³⁵ in the design and implementation of its initiative. Additionally, a balanced distribution of interventions across the region was achieved.

Existing networks were supported, collaboration attitudes among stakeholders fostered and professional capacities enhanced, in the attempt to **develop structured processes at the territorial level**. Even though the sustainability of this territory-focussed approach is uncertain, as the evidence of the impact is not yet available, it is expected that disseminating good examples and interventions all over the region, under a common policy framework and guidance, may lead to the structuring of green energy processes. This is also theoretically supported by the high transfer potential of both the method of intervention (calls for projects) and the ‘user-friendly’ project management practices implemented.

3.2.8 References and further reading

ADEME [web site](#), accessed November 2011

A.G.I.R. [web site](#), accessed November 2011

CPER (2007-2013), [Contrat de Projects État-Region](#)

EURÉVAL (2010), Centre Européen d’Expertise en Evaluation, [Evaluation globale de la démarche A.G.I.R. \(Action Globale Innovante pour la Région\), Final Report Summary, 2010](#)

FEDARENE best practice [web page](#), accessed November 2011

La Grenelle de l’Environnement [web page](#), accessed November 2011

PACA [web site](#), accessed November 2011

³⁵ Assistance à maîtrise d’ouvrage (AMO).

PACA (2006), [Charte d'Engagement AGIR](#)

PACA (2009), [Fiche Action Région](#)

PACA (2010), [A.G.I.R. Bilan 2007-2010](#)

PACA (2011), [presentation](#) at the Comité Régional Développement Durable et Grenelle meeting, January 4th 2011

PACA-State [Convention](#) (2009)

3.3 SE - The City of Stockholm's Climate Initiatives

3.3.1 Status

The City of Stockholm's climate efforts to tackle greenhouse gases (GHG) are on-going since 1995, with two five-year programmes having already been successfully implemented (1995-2000 and 2000-2005) and a new 10-year action plan launched in 2010 (City of Stockholm, 2010a). The city has long-term plans for the continuation of the initiatives with follow-up programmes scheduled until 2050, envisioning becoming fossil fuel-free.

3.3.2 Synopsis

- ▶▶ The City of Stockholm's climate initiatives refer to the on-going measures taken since the mid-nineties by the city administration to combat GHG emissions. They include two five-year action programmes (1995-2000 and 2000-2005) as well as an action plan covering the 10-year period 2010-2020. The long-term goal of these initiatives is to maintain the same reduction rate of carbon emissions leading to the city being carbon-free in 2050.
- ▶▶ The mid-term objectives of the initiatives have so far been achieved. Implementation of the action plans has been successful and the overall targets set for annual CO₂e per capita emissions have been exceeded.
- ▶▶ Achievements include: reduction of CO₂e emissions per capita to 4.7 tonnes in 2000; reduction of CO₂e emissions per capita to 4.0 tonnes in 2005; reduction of CO₂e emissions per capita to 3.4 tonnes in 2009; CO₂e emissions in household electricity and gas of approximately 600 tonnes in 2009 marginally reduced below the baseline level despite population increase of approximately 22%; reduction of CO₂e emissions in transportation to approximately 950 tonnes from approximately 1,050 tonnes in 1990, despite

increasing transport mileage; and reduction of CO₂e emissions in heating to approximately 1,100 tonnes from approximately 1,950 tonnes in 1990.

- ▶ The City of Stockholm's climate initiatives are an example of comprehensive and systematic efforts to achieve a long-term vision for LCE. Its success is mainly due to the continuous and coordinated efforts of the entire local administration, the achievement of political consensus, the involvement of both the business community and local citizens as well as the effective exchanges of experiences at the international level.

3.3.3 Implementing authorities

The implementation of Stockholm's climate initiatives is a decision taken by the City Council. Overall responsibility for ensuring proper follow-up of the Council's decisions, including the supervision of climate initiatives implementation and the evaluation of results, rests with the City Executive Board. The latter, assisted by the Executive Office, is also in charge of financial administration and ensures the sustainability of climate plans.

The Environment and Health Administration, responsible for environmental monitoring, and the City Planning Administration, in charge of land-use planning and of issuing of building permits, are the main city departments involved in the day-to-day operations related with the implementation of the climate initiatives.

3.3.4 Other relevant stakeholders

The City of Stockholm has strategically chosen to collaborate with other public authorities and agencies, as well as with the private sector and the general public, in order to achieve its climate and energy goals, and maximise the impact of its initiatives. More precisely, measures aiming at the reduction of the city's own energy consumption and operational costs are implemented through the Stockholm Energy Centre, which is the city's internal energy advisory service. Public transport issues are managed together with Stockholm Public Transport (SL), a county agency responsible for the provision of public transport services. Issues related to the traffic congestion tax (e.g. assessment of impact on traffic, public transport, traffic safety, business and environment), are managed by the Stockholm City Traffic Administration, with the support of the Swedish Transport Administration. Likewise, for issues related to district heating/cooling, the city works together with the energy production company Fortum Värme, which operates four main plants locally that produce heat and electricity, and provides facilities for district cooling.

In addition, the contribution of the private sector has been strongly encouraged by the city authorities. More than 125 companies are involved in the implementation of the city's plan through the 'Climate Pact', an initiative launched in September 2007 with a view to engaging business in local climate action (Stockholm City, 2010b). The Climate Pact is being used by the city and businesses as a platform for inspiration, sharing of good practices and annual reporting on environmental work. Participating companies commit to the same goals as with the City of Stockholm and are free to choose their own actions towards fulfilling their commitments.

Among the key stakeholders of the initiatives are also the citizens themselves; their involvement facilitates the implementation of measures beyond the City of Stockholm's direct mandate. The city authorities facilitate the direct involvement of individuals and families living in Stockholm in several ways, but notably through the Climate Account, a web-based application assisting users to monitor their emissions and take actions to reduce their carbon footprint.

3.3.5 Background

The City of Stockholm has a long tradition of working towards ambitious environmental targets, as the local planning system and utilities infrastructure indicate: efficient public transportation system, green areas within a distance of less than 300m from each residence, dense city centre facilitating district heating and cooling, etc. The construction of a low carbon energy infrastructure in the city, specifically of the district heating system, dates back to the late 1950s, while already in the mid-1960s biofuel started replacing oil and coal in energy production.

The local authorities initiated a long-term formal commitment to address GHG emissions in the mid-1990s, with the adoption of the Environmental Plan for Stockholm, which set clear objectives and actions for the period 1995-2000. GHG emissions per capita in the year 1990, amounting to 5.4 tonnes of CO₂e, were set as a baseline for the measurement of results. The success of the initial plan led to a decision by the City Council for more ambitious targets, gradually scaling up towards abandoning the use of fossil fuel by 2050.

The city's climate initiatives are integrated in other processes for sustainable growth running in parallel, such as the 'Vision Stockholm 2030' project, which began in 2006 with a view to formulating a long-term complete vision for the development of the city, and the 'Walkable City', Stockholm's new city plan adopted in 2010 (City of Stockholm, 2010c, 2010d and 2010e).

The European Commission designated Stockholm as ‘European Green Capital of the year’ for 2010 on the basis of a series of environmental criteria, including the city’s contribution to global climate change, notably its action programme for the reduction of GHG emissions (City of Stockholm, 2010f).

3.3.6 Description of the programme/project

Objectives, targets and measures

Stockholm’s climate initiatives refer to the on-going measures taken since the mid-1990s by the city administration against GHG emissions. They have been developed within the framework of a series of action plans, each setting specific targets on GHG emissions reduction, which gradually lead to the achievement of the long-term objective of eliminating the use of fossil fuel by 2050. The initiatives, all supported by a number of communication projects, focus on three main areas of intervention: (i) household electricity and gas; (ii) transportation; and (iii) heating. The action plans’ targets are set only against overall CO_{2e} reduction levels, though the achieved results are specified per area of focus. Table 3.3 summarises targets and results.

Measures which have led to substantial emissions reduction include:

- Improvements in the district heating and heat pumps system, such as the expansion of the district heating network to replace oil and gas-fired boilers in households, the increase in the share of RES in heat production, etc.
- Energy-efficiency improvement in buildings, with actions such as the increase of municipal appropriations for investments in properties and decrease of budget available for operational costs (property management), the installation/upgrading of building automation systems, the improvement of window insulation, the replacement of conventional lights with diode lighting (LED), etc.
- Promotion of clean vehicles and of renewable fuels through changes in municipal procurement standards, collaboration with the private sector (e.g. the Vattenfall energy company, Fortum, etc.) and other municipalities to increase the share of electric vehicles and plug-in hybrids (PHEVs) in both Stockholm and Sweden generally, with actions such as the construction of more charging stations.
- Traffic regulations, notably the implementation of a congestion tax scheme (launched in 2007).

- Public transport investments, including on the expansion of bus services (new bus lines and vehicles) and the use of biofuels to power buses.
- The promotion of bicycle use, with investments in cycle lanes and paths.
- Communication projects targeting both the business community (e.g. Climate Pact) and local citizens (e.g. Climate Account, awareness campaigns at schools, etc.).

Moreover, the City of Stockholm has promoted the production of district cooling using water from nearby lakes and the sea and aiming at phasing out less efficient cooling units (conventional air-conditioning systems).

Impact and results

Quantitative indicators are used to assess the impact of the initiatives in terms of carbon emission reduction. Achievements are quantified in Table 3.3.

Table 3.3 – Stockholm City Climate and Energy goals and achievements

Area	Goals	Achievements
Overall CO ₂ e emissions	<ul style="list-style-type: none"> - To reach the baseline level of 5.4 tonnes per capita, by the year 2000 - To reduce per capita emissions to 4.0 tonnes by the year 2005 - To reduce per capita emissions to 3.0 tonnes by the year 2015 	<ul style="list-style-type: none"> - Reduction of CO₂e emissions per capita to 4.7 tonnes in 2000 - Reduction of CO₂e emissions per capita to 4.0 tonnes in 2005 - Reduction of CO₂e emissions per capita to 3.4 tonnes in 2009³⁶
Household electricity and gas		CO ₂ e emissions of approx. 600 tonnes in 2009, marginally reduced below the baseline level despite population increase of approx. 22%
Transportation		Reduction of CO ₂ e emissions to approx. 950 tonnes from approx. 1,050 tonnes in 1990, despite increased transport mileage
Heating		Reduction of CO ₂ e emissions to approx. 1,100 tonnes from approx. 1,950 tonnes in 1990

Sources: Lönngrén Ö., Hedvik C., Musabasic A., 2010; City of Stockholm, 2010a; Sigurdson B. and Hedvik C., 2008

³⁶ The figure is based on estimates using preliminary statistics (due to statistics time lag, which is approximately 18 months).

The City of Stockholm monitors the results of the initiatives using estimates of GHG emissions³⁷, which are based on (mostly annual) statistical data from two main sources: Statistics Sweden, for district heating and electricity consumption; and the Environment and Health Administration (EHA), for transportation. More specifically, data from the Fortum Värme's energy production plants feed into the calculations of district heating emissions, data from the power production plant in Nordpool are used for calculations of electricity use, and data on road transport journeys, electricity for rail transport, air transport³⁸, shipping and machinery use are used for transportation calculations.

Indirect indicators, such as energy use in buildings, trends in car sales, etc., are also used by the city administration to make estimates of progress within specific focus areas.

A follow-up assessment of the Stockholm Action Programme against Greenhouse Gas Emissions 2000-2005 was carried out with the subsequent report produced in 2007 (revised in 2008) by EHA in collaboration with the department of Industrial Ecology at the Royal Institute of Technology. The audit followed up on 38 of the 48 measures that were included in the action programme and concluded that the emission reduction target was exceeded, leading to a total decrease of CO₂e emissions by 440,000 tonnes during the period 2000-2005.

Sustainability

The City of Stockholm has implemented several communication projects facilitating the active involvement of citizens in the climate initiatives, such as the 'Climate Neutral Stockholmers' campaign and the Climate Account. The projects focused on the promotion of the City Council's LCE goals, as well as on the provision of advice on individual actions to increase energy efficiency and reduce GHG emissions.

The participatory approach taken in the implementation of climate actions (collaboration with other public authorities, Climate Pact, involvement of citizens) has strengthened local ownership and positively affected the sustainability of the climate initiatives; the long-term vision of climate efforts further contributes to that end.

³⁷ Measured GHG cover (fossil-based) carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O), estimated with the use of the life-cycle approach (addressing both production and distribution). GHG emissions from sources other than combustion (e.g. freon in air-conditioning systems) are not included in the action plans' goals, hence are reported separately.

³⁸ Concerns fuel consumption during take-off and landing within a height of 915m, in line with the Swedish Aviation Authority (*Luftfartsverket's* directive).

Financing of the climate initiatives comes largely from the City of Stockholm's budget. Additional funding is secured through government subsidies, as well as the active involvement of other stakeholders, mainly from the business community. More precisely, during the period 2005-09, co-financing totalling some 5.5 million EUR was provided through the Swedish Climate Investment Programme (KLIMP), while in 2004 and 2005, the 'Environmental Billion Fund' (*Miljömiljarden*), a multi-annual investment scheme for environmental projects, allocated approximately 42 million EUR to 45 projects related to climate initiatives, such as the phasing out of oil heating, the production and distribution of biogas, mobility actions, etc.

Linkages with national and/or EU frameworks

The City of Stockholm, in line with its international strategy and its long-term vision for the year 2030, has taken actions to position itself among the leading sustainable growth actors, in particular in northern Europe. In this respect, it has been involved in a wide number of international organisations and networks, such as EUROCITIES, C40 Climate Leadership Group, ICLEI-Cities for climate protection campaign, etc. As a signatory to the Covenant of Mayors, the City of Stockholm has submitted its sustainable energy action plan (SEAP) to the EC Joint Research Centre (JRS) for verification and approval. Stockholm has participated in the EU-funded COMBAT³⁹ project aiming at jointly working with other Baltic capitals towards improving their SEAPs and identifying appropriate monitoring indicators.

At the national level, the City of Stockholm has received approximately 30% of co-financing from the Swedish Environment Protection Agency, for the implementation of projects included in KLIMP.

3.3.7 Analysis

Assessment of achievements

The implementation of the Stockholm climate and energy initiatives has, until now, been successful: all interim overall emission reduction targets set with each of the three action plans adopted since 1995, have been exceeded, while both a solid structure and a momentum have been created for the continuation of actions till the achievement of the city's long-term vision.

³⁹ The 'Covenant of Mayors in the Central Baltic capitals' project was co-financed by ERDF, under the Interreg IV A Programme.

Since the 1990 baseline levels, annual per capita CO₂e emissions fell by more than 25% in 2005 (corresponding to a total of about 650,000 tonnes CO₂e), while at the same time emissions at the national level were reduced by only 7%. Moreover, the systematic efforts of the city administration to encourage and support the involvement of the business community and the city's citizens, has raised reasonable expectations for the implementation of additional LCE-related measures, addressing areas in which the city does not have full control (such as energy efficiency in non-municipal buildings, use of clean cars, etc.).

However, the impressive reduction in carbon emissions was not linked to a relevant decrease in overall energy consumption; this implies that the carbon related benefits have come mainly from technical advancements and not so much from changes in social behaviour patterns. In this context, future LCE action plans should consider prioritising the promotion of a systemic social transformation in the direction of sustainable lifestyles.

Success factors

Key to the success of the City of Stockholm's climate initiatives have been the **early, systematic and comprehensive considerations of GHG emissions measures**. Continuous efforts combine a long-term vision and ambitious but feasible interim goals; targets and actions have been shaped through a series of plans serving a vision shared by all, with **each set of proposed measures building on the work of the previous period**. Attention has also been given to the **achievement of concrete results within a reasonable timeframe**, a fact that inevitably attracted the interest of politicians and secured long-term commitment.

At the governance level, one of the success factors has been the **time and attention given to methodical efforts for the achievement of political consensus** when seeking approval of the climate-related action plans; the role of the City Executive Board has been crucial in that respect. Reporting and analysis of emissions facilitated the assessment of measures in terms of cost-efficiency and offered a solid basis for the selection of emission targets, on the one hand and of the most appropriate actions in the given time frame on the other. Moreover, the endorsement of the emission targets by the City Council facilitates the involvement of the entire city administration in the implementation of the proposed measures, with each action plan being followed up by all administrative departments.

At an operational level, an important success factor has been the **coordination with other city plans**; such an intense cooperation among city departments was made possible because of the high level of approval of the proposed actions. The

integration of measures and the coordination of actions with other administrative departments and agencies, both inside and outside the municipality, have created synergies, in terms of making best use of available resources and mobilising a large part of the city administration towards the achievement of common goals.

As regards the implementation approach, the strategic choice to **secure the involvement of both the business community and local citizens with actions that go beyond the conventional type of awareness-raising and promotional campaigns** has been crucial to success. Local stakeholders appreciated the participatory approach actively followed by the city administration and this led to the multiplication of the impact of measures taken by the local authority.

Moreover, **close collaboration with the private sector and with other administrations** promoted measures that would have otherwise been unfeasible, such as the use of clean vehicles, which was made possible following the removal of market obstacles linked with their sale and maintenance.

Lastly, a positive aspect was the **active involvement of the city of Stockholm in relevant EU and international initiatives**; through its participation in networks and joint initiatives together with other local authorities, the city shared experiences and managed to find solutions on issues of concern, such as innovative measures, indicators, etc.

3.3.8 References and further reading

City of Stockholm (2006), [Facts and results from the Stockholm Trials](#), Final version – December 2006

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3.4 UK - Gloucester City Climate Change Strategy 2010

3.4.1 Status

The Gloucester City Climate Change Strategy 2010 (the ‘Strategy’ from now onwards) was adopted by the City Council’s Cabinet in July 2007 and since then was reviewed annually. The implementation of the Strategy was completed in 2010. Decision on a follow up strategy has not been taken yet.

3.4.2 Synopsis

- ▶▶ The Gloucester City Climate Change Strategy 2010 is together with the City Energy Management Strategy (2003-2004 and 2006-2007) the main policy commitments of the Gloucester City towards LCE.
- ▶▶ The Strategy has been successfully completed, leading to the reduction of CO₂ emissions by 8% at the end of 2010; however, the duration of the implementation period was too short (mid 2007-2010) for major improvements to be made.
- ▶▶ Results include a significant reduction of CO₂e emissions from City Council gas consumption, own transport and business travels. There is also evidence of a major change in work patterns within the entire city organisation, favouring LCE processes and behaviours.
- ▶▶ The Strategy is a useful example of how short-term planning within a small-sized local authority can produce positive results in carbon emissions reduction, through the promotion of small but feasible changes within its organisation and community members. Its success is due to the wide mobilisation of the Council’s staff, the prioritisation of measures promoting changes in behavioural patterns among both staff and community members, the involvement of local citizens leveraging private investments in LCE-related actions, as well as the appropriate guidance on monitoring and reporting provided by central government.

3.4.3 Implementing authorities

The Strategy, endorsed by the Gloucester City Council⁴⁰ (GCC), has been developed and implemented by the Gloucester City Administration (GCA). With regard to the local airport operation, GCA co-operated with Cheltenham

⁴⁰ A local authority for the Gloucester district of Gloucestershire; the city has a population of about 110,000 and covers an area of 4,050,000 hectares.

Borough and the airport management in terms of annual emission targets and methodology calculating the air operations' carbon footprint.

Key implementing groups within GCA were the Energy Action Delivery Group and the Climate Change Steering Group. The first one is an officer steering group, responsible for monitoring and monthly reporting of energy use, as well as for supervising new energy reduction projects within the council's buildings. The second has a broader mandate, working with sustainability- and energy-related projects (e.g. renewable energy installations), with a view to demonstrating community leadership (lead-by-example).

3.4.4 Other relevant stakeholders

GCC has developed a series of collaborations with other authorities and agencies (both public and private) with a view to promoting the implementation of selected measures. More precisely, in the field of RE and energy saving in buildings, GCC works together with (or supports the work of) the Gloucestershire Energy Efficiency Advice Centre, the Severn Wye Energy Agency, as well as utility funded schemes such as the Affordable Warmth Strategy for the County, the Warm and Well Scheme, Warm Front, etc. On the management of waste⁴¹, GCC co-operates with the Gloucestershire County Council and other city councils, through the County Waste Management Partnership. GCC is responsible for waste collection, whereas the County is responsible for waste disposal. GCC works with the County Council also on transportation issues; Gloucestershire County Council, has authority on highways and is responsible for Transport planning and infrastructure in Gloucester.

3.4.5 Background

GCC's official commitment to address GHG emissions and climate change dates back to June 2001 with the signing of the 'Nottingham Declaration on Climate Change' (GCC, 2001). The Declaration foresees that signatories: (i) contribute at local level to the delivery of the UK climate change programme, by working together with the central government; (ii) plan, together with local communities, actions to address climate change and to significantly reduce GHG emissions from their *'own authority's operations especially energy sourcing and use, travel and transport, waste production and disposal and the purchasing of goods and services'*; (iii) encourage all sectors in the local community to publicly commit to similar emission reduction goals; (iv) collaborate with key

⁴¹ Waste is considered relevant to the climate change strategy due to the gas (about 65% CH₄ and 35% CO₂) generation from breaking down of biodegradable waste.

local providers (such as the health community, businesses and development organisations) towards climate change adaptation; (v) facilitate the local development of RE projects; and (vi) monitor progress and communicate results.

Prior to the Nottingham Declaration, GCC had made other commitments which address indirectly the Low Carbon Development path, such as: signing up to the Government Corporate Commitment to Energy Efficiency, in 1992, involving annual energy use reduction and progress reporting to the secretary of state for the environment; the adoption of an Environmental Strategy, in 1995, making policy references towards energy reduction and support of RES development; the adoption of a Green Transport Plan, in 2001, addressing fleet management and fuel consumption issues; and the adoption, in 2001, of a sustainable development strategy (Local Agenda 21), leading to the delivery of an Energy Advice centre for the city.

Following the Nottingham Declaration, GCC made two main policy commitments towards energy use and carbon emissions reductions: the City Energy Management Strategy (2003-2004 and 2006-2007), which looked into increasing the share of RES and implementing proactive energy saving measures; and the Climate Change Strategy (2007 to 2010). Moreover, according to the South West Regional Planning Guidance, GCC, along with energy suppliers and other agencies operating in the region, aimed at reducing CO₂ emissions by 20% by 2010, as well as at using RES to generate at least 11% of electricity by the same year. Likewise, a sub regional level target was set to increase electricity production from RES to 40-50MW (from 9MW).

As regards the baseline situation at the time of adoption of the Strategy, according to data provided by DEFRA (2008), the annual CO₂e per capita emissions in Gloucester amounted to 5.9 tonnes, including household, industrial, and road transport emissions. This figure corresponds to a total annual emission of 653,000 tonnes of carbon equivalent.

3.4.6 Description of the programme/project

Objectives, targets and measures

The Strategy focused on both climate change mitigation and adaptation. With regard to GHG emissions, it aimed at: (i) increasing public awareness on how citizens and local organisations can reduce the impact of their activities on the climate; (ii) achieving the greatest possible emissions reduction, exceeding central and regional government targets; (iii) increasing the share of low carbon energy sources, including RES, in electricity produced in Gloucester, to at least

11% by 2010; and (iv) reducing, by 2010, City Council estate emissions by 10%.

Objectives and measures addressed three key areas of intervention, in line with the main city operations: management of own estate, provision of services and community leadership. The Strategy dealt with emissions from the city buildings, the use of energy during city operations, the production of waste, staff travelling, and fleet vehicle fuel consumption, including both own and contractors vehicles. In addition, airport air operations emissions were considered and an annual limit of 4,000 tonnes of CO₂ was set in agreement with the airport management and Cheltenham Borough Council.

Planned measures related to LCE were organised in the following, often interrelated, fields:

- Buildings, including actions such as: the encouragement (through grant aids) of the use of solar hot water systems in social housing (in collaboration with social housing providers); the training and accreditation of GCA building control staff on the Code for Sustainable Homes and the BREEAM standard⁴², with a view to providing advice to developers and other relevant GCA staff (e.g. development control staff); the Energy Champions concept, supporting employees to take responsibility of energy use monitoring and management in their workspace, etc.
- Transport, with actions such as the promotion of electric bike and the car club concept⁴³ facilitating occasional car use by individuals and companies.
- Waste, with initiatives such as the promotion of climate friendly purchasing policies (favouring purchasing of recycled products), the establishment of recycling programmes at work, etc.
- Renewable Energy, including actions such as the installation of wind turbines in GCC own estates, e.g. the Alney Island wind turbine, or on school grounds, the installation of biomass boilers in city or other buildings, etc.

Other thematic sectors addressed by the Strategy, not directly relevant to LCE issues, were related to water resources, biodiversity and adaptation. Detailed qualitative and quantitative targets were set for each of the seven

⁴² Building Research Establishment Environmental Assessment Method.

⁴³ <http://www.commonwheels.org.uk>

aforementioned fields. In addition, specific advice on how the citizens could contribute to these targets was provided.

Impact and results

The impact of the Strategy is measured in terms of GHG emission reduction levels. Annual results from 2008 to 2010 are presented in table 3.4.1.

Table 3.4 – Gloucester City Council emission reduction results

Area	Results (in tonnes of CO ₂ e)		
	2008	2009	2010
Gas consumption	3,307	2,465	2,219
Owned transport	436	26	33
Purchased electricity	2,452	2,545	2,528
Business travel	49	42	33
Contractor fleet	549	822	1,422
Public transportation business travel	3	5	4
Waste Disposal/Recycling	14	12	15
Total gross emissions	6,813	5,913	6,257
Change against base year	100%	-13%	-8%

Source: GCC, 2011a and 2011b

GCA carried out annual monitoring of progress and reporting of results in line with the government's guidance on GHG emissions measurement and reporting (UK Department of Climate Change Guidance⁴⁴). Calculations and reporting were adapted accordingly to the changes in the government's guidance notes. As regards waste emissions, the data used refers to waste collected or recycled from city buildings, though it does not cover all buildings.

Sustainability

An important aspect of the GCC Strategy was its communication approach, targeting all members of the local community, in particular the youth. GCC aimed at linking its initiatives to national climate change programmes, and implemented information and awareness campaigns with a view to increasing public understanding as well as local ownership. Beyond traditional information dissemination tools, e.g. use of web pages, leaflets, seminars and road shows, GCA established a Low Carbon Partnership of large employers, building on Vision 21, a collaboration model successfully implemented in the neighbouring area of Cheltenham.

⁴⁴ http://www.decc.gov.uk/en/content/cms/emissions/crc_efficiency/guidance/guidance.aspx

Funding of the initiatives came from multiple sources, including own funds, e.g. the energy management budget, and government subsidies, such as the Low Carbon Buildings Programme. GCC's commitment to the Strategy provided the required political will to facilitate the allocation of adequate GCA staff working hours to the implementation of the strategy.

Linkages with national and/or EU frameworks

GCC Climate Change Strategy 2010 targets are in line with the UK Energy White Paper (DTI, 2007) commitments to reduce CO₂ emissions by 60% by 2050, with real progress already by 2020. Likewise, the Strategy assisted UK efforts under the Kyoto Protocol requirements, to reduce its GHG emissions by 12.5% below 1990 levels by 2008-2012.

Further, the Council used central government grants e.g. the Low Carbon Buildings Programme, to support the implementation of some of the Strategy's measures.

3.4.7 Analysis

Assessment of achievements

The GCC Strategy was successfully completed, with reported emissions indicating a significant reduction of total carbon footprint (-8% to -13% from the baseline year), despite the short implementation period. A follow-up report assessing the level of achievement of the targets set for each field of action is not yet available, even though the measured emission levels provide a basis for prioritisation of actions in the future.

Results show a decrease in, among other areas, 'own transport' and 'business travel', despite that no capital investments were made (e.g. purchase of less polluting vehicles); such evidence of a major reduction in the number of travels made by GCA staff implies a radical change in work patterns within the entire city organisation. On the other hand, the substantial increase in contractors' fleet emissions shows GCA's inability to control third party environmental performance. Inevitably, more time would be required for both changes in procurement procedures and a monitoring mechanism to be applied and made fully operational.

Success factors

The success of the GCC Strategy went hand in hand with the **mobilisation of GCA own staff** and the **involvement of community members in the**

implementation of the proposed actions. Local ownership and commitment to the emission reduction targets facilitated improvements to be made, despite the relatively limited funds available for implementation. Moreover, it inevitably attracted the interest of local policy makers, securing **high-level political support**.

The Strategy **prioritised measures which promoted a change in behavioural patterns.** Both the Energy Action Delivery Group and the Climate Change Steering Group worked closely with staff across the city organisation as well as with third parties (developers, energy agencies and schemes, etc.) and community members, to induce changes towards sustainable lifestyles.

Furthermore, by **demonstrating community leadership**, GCA achieved not only close collaboration with energy agencies and other stakeholders in the implementation of the proposed measures, but also influence over processes that were beyond its official control, thus resulting in the multiplication of the Strategy's impact.

At an operational level, key to the success of the Strategy was the **availability of central government guidance on monitoring and reporting methods**, which allowed a relatively small local authority to follow up on implementation progress and use its emission results as a benchmarking tool. This is of particular importance, also because GCC was not involved in any EU project or other international initiative facilitating experience sharing.

Moreover, given the limited availability of own resources, **strategy implementation benefited from multi-source funding**, focusing on making best use of government grants and most importantly on **leveraging private investments**.

3.4.8 References and further reading

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4. Conclusions and recommendations

Conclusions and recommendations are structured around three main areas⁴⁵: legislation, investment support, and capacity building. A fourth, general area, has been also considered to highlight any other framework conditions potentially able to facilitate the transition by LRAs to LCE, as detected from the evidence provided by in this study.

4.1 Legislative frame work

At the institutional level, there seem to be some common conditions enabling the success of the transition to LCE by a local or a regional authority. These conditions include: (i) a medium- to long-term vision by policy makers with interim milestones that, once achieved, become the basis for further developments. This ‘building on the results’ approach facilitates political consensus and a longer-term support regardless of the administration in charge;⁴⁶ (ii) the framing of the strategy into national or EU policies or legislation, often securing some institutional and financial support from these levels, or guidance; (iii) the setting of concrete and reachable targets in a reasonable timeframe, usually making implementation more focussed and initiatives/measures more concrete; (iv) the commitment by authorities to a set of mandatory and/or voluntary targets; (v) the adoption of monitoring and evaluation tools to measure progress and detect the need for adjustments along the way.

Legislative interventions at the national and EU level may influence at least three of the above conditions: the framing of local/regional strategies in wider and supportive contexts; the setting of targets; the voluntary undertaking of commitments. The national and EU levels are called to provide the right reference conditions, such as for example: the fiscal policy in Upper Austria, financially supporting EE and RE at the regional level; the legislative and policy frameworks supporting the coordinated intervention by the State, the PACA region and ADEME, in France; the UK central government guidance on monitoring and reporting methods to the Gloucester City Council; the Covenant of Mayors initiative, voluntarily committing its signatories, among which is the City of Stockholm, to meet and exceed the EU 20% CO₂ reduction target by 2020; EC support towards a more effective use of available resources under the

⁴⁵ As per the technical specifications of this study.

⁴⁶ On the basis of the limited evidence gained through the case studies presented in Part 3, it was also noted that by making the key driving factor the quality of the strategy, as opposed to the availability of funds, it was possible to mobilise enough funding, often from different sources.

Cohesion Policy 2007-2013 programming period (European Commission, 2011d).

In general, the commitments taken by the EU towards medium- (2020) to long-term (2050) quantitative targets would require either passing over these commitments to Member States (MS), by including binding targets into relevant Directives, or facilitating the voluntary commitment by public and private stakeholders, so as to create enough 'critical mass' to achieve the desired impacts. In this context, and on the basis of the evidence gathered through the case studies, the setting of concrete targets seems to facilitate the achievement of measurable results at the local and regional level. Thus:

⇒ *The 'setting of multi-level targets' approach is an effective way forward to contribute to EU medium- to long-term targets for EE and RE. Such an approach should be structured at the territorial level through the setting of voluntary or mandatory targets at the regional and, possibly, local level with the overall aim to contribute to national goals.*

At the EU level, this would imply the review of relevant Directives, including in a 2050 perspective. For example, the reference is to: the Proposal for a Directive of the European Parliament and of the Council on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC; and the Renewable Energy Directive (Directive 2009/28/EC), setting mandatory targets for 2020, on which a consultation is currently on-going to assess the opportunity of revision in a 2050 perspective.

At the national level, it could imply the development of 'structured' targets at the territorial level, aimed at actively involving local authorities according to their reduction potential, and pointing to the achievement of the common goal of the national target. Such a 'structure' is evident in the Gloucester case, UK.

Several LRAs have voluntarily committed to emissions reduction or developed regional/local schemes within the framework under which both public and private actors are called to undertake EE and RE measures. These initiatives should be encouraged.

⇒ *Support voluntary commitment initiatives undertaken by public authorities and private stakeholders, for example by providing the means to objectively assess local potential or financial incentives (grants) to involve private actors.*

For public authorities, the aim is to avoid the occurrence of the ‘carbon (or emission) gap’, i.e. the gap originating from making political commitments, such as reduction objectives that are not grounded on the analysis of local potential and are thus not achievable.⁴⁷ The need to involve the private sector through voluntary agreement programmes or schemes articulated around the setting of concrete targets is self-evident if the ability of public authorities to control third party environmental performance is to be enhanced. The ‘Climate Pact’ of the City of Stockholm is an example of this type of engagement where, nevertheless, the business community is left free to decide what action it takes towards the fulfilment of their commitments.

Notwithstanding past and current efforts, EU funds are still underutilised in several MS. This systemic inefficiency needs to be structurally overcome and all MS and regional/local authorities need to be put in a position to take full advantage of the resources allocated to them.

⇒ *Consider assessing the reasons, on a national basis, for the ineffective use of Structural and Cohesion Funds towards the development of a low carbon economy, highlighting concrete solutions for each MS and outlining necessary actions by national and LRAs to overcome the constraints.*

4.2 Investment support

Investing on local and regional energy agencies

In 2010, about 380 local and regional agencies were operating across the EU. These agencies are called to provide: (i) support to the introduction of energy management good practices; (ii) advice and technical assistance to public authorities; (iii) information; and (iv) services tailored to local energy needs. Since the early-1990s, action has been taken at the EU level to support LRAs in improving their knowledge and capacities for implementing sustainable energy solutions through the establishment of energy agencies; some 200 energy agencies were created at the local and regional level within the framework of the SAVE (i.e. SAVE and SAVE II) programme; a further 80 agencies were established before 2009 with the support of the Intelligent Energy-Europe (IEE) programme (2003-2013) (Matrix Insight and Ecologic Institute, 2010).

⁴⁷ A recently launched EU Initiative ‘[Smart Cities and Communities](#)’ goes in this direction as it provides support to cities through an 80 million EUR package.

Well-operating agencies undoubtedly add value to the transition of LRAs to LCE. The Upper Austria case is self-explanatory in this sense. *O.Ö. Energiesparverband* (ESV) is pivotal to the implementation of the regional energy strategy, both at a managerial and technical level. It is also crucial for the development of a local green energy market and liaises with major energy-related actors at the national, European and international level. In particular, close collaboration of ESV with EU institutions provides for crucial feedback on the implementation of EU policies at the local and regional level.

According to the core role that local and regional agencies are potentially able to play in the development of LCE, and in line with the relatively positive findings of the evaluation of the support of EU funding to these agencies (Matrix Insight and Ecologic Institute, 2010), the following is suggested:

⇒ *Consider continuing to provide ‘establishment’ grants to support the creation of new energy agencies at the local and regional level where these agencies address an explicit local need or request.*

Such assistance has the two-fold aim of providing valuable technical support locally, as well as guidance in line with EU policy goals and targets.

Besides investing in new agencies it would be appropriate to address the reasons for the low performance of some existing agencies, including on the basis of the recent evaluation, and consider means for the ‘revitalisation’ of the not-for-profit agencies.⁴⁸

⇒ *Consider providing support by means of a set of incentives (financial, fiscal, regulatory, etc.) to existing energy agencies that are still unable to operate effectively in the territory.*

Investment to deploy effective solutions for the connection of RES to the grid

In October 2011, the EC has adopted the ‘Connecting Europe Facility’ aiming at supporting European networks in the energy, transport and digital sectors. In particular, the energy sector has been allocated 9.1 billion EUR for investment in trans-European infrastructure to secure supply and allow the transport of renewable energy in a cost effective manner.⁴⁹ The structural change of the

⁴⁸ Reference is to two types of energy agencies, out of the four identified by the evaluation study, namely the not-for-profit, independent agencies with a broad long-term mandate, where the two types are distinguished on the basis of the source of funding, mostly public in one type and both public and private in the other type (Matrix Insight and Ecologic Institute, 2010).

⁴⁹Europa press release 19/10/201: [Connecting Europe Facility: Commission adopts plan for €50 billion boost to European networks.](#)

power generation system is not only a large-scale problem; the decentralisation derived from the increased reliance on renewable generation makes it imperative to integrate decentralised power generation systems into the grid. In particular, intervention by LRAs at the territorial level for the development of local RES and green energy markets, able to compete with traditional energy sources, may be nullified by the lack of effective solutions to link RES to energy distribution systems. The case of A.G.I.R. in the PACA region shows how difficult it is to embed structured processes for RE penetration into territorial development, notwithstanding high policy support, and the adapted-to-the-needs methods of intervention. In this context, it is suggested that:

⇒ *High priority should be given at the EU level to translate on-going research and regulatory efforts related to the grid connection of decentralised power generation systems into concrete and effective solutions, adaptable to the wide range of existing situations and related problems across Europe, to be proposed to LRAs and local private investors in a simple and pragmatic way (e.g. by means of toolkits).*

There are technical, economic, legal, and acceptance constraints to the grid integration of RES that need to be overcome. These constraints are deeply dependent upon existing conditions at the territorial level that vary greatly across the EU.

⇒ *Institutional representatives of LRAs should be formally involved in on-going and future European efforts towards the implementation of smart grids, for example as members of relevant task forces, together with representatives of the European Commission services.*

Promotion of innovative business models to foster investments at the local level

Over the medium- to long-term, a shift from high fuel and operational cost to high capital costs is expected (European Commission, 2011c). This is a direct consequence of: the needed structural change of the power generation system; the old equipment and technologies coming to the end of their effective life cycle; and the need to introduce new devices into the daily life of energy users. Investments are therefore expected at all levels, from public authorities, to private sector, and end-users. There is an evident opportunity for an increasing demand for the industry and for energy service providers that can drive the development of green energy markets, as demonstrated by the successful development and growth of the *Oekoenergie-Cluster* (OEC) in Upper Austria. However, this demand may be constrained by the challenge of financing the up-front cost of necessary investments. Upper Austria also provides an example in

this sense, with the third party financing system applied within the Energy Contracting Programme.

Energy performance contracting has already been addressed by the EC in the provisions of Article 14 of the Proposal for a Directive of the European Parliament and of the Council on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC. Such provisions aim to overcome existing barriers to the implementation of such contracts that are thus duly acknowledged, especially with regard to *‘ambiguities in the legal framework and the lack of reliable energy consumption data to establish the baselines against which performance is measured’* (European Commission, 2011e). Several MS have already issued relevant legislation in this direction; others still need to do likewise.

⇒ *Apart from the on-going efforts at the EU level, more concrete action at the national level is needed in some MS to set enabling framework conditions for the deployment of effective energy performance contracting.*

Leveraging private investments in EE, RE, or decentralised energy generation/smart grids projects, through either energy performance contracting or joint investment schemes with LRAs (e.g. with the use of the Jessica instrument) is a major challenge, especially considering the systemic effects of the on-going Eurozone crisis (reduced potential of MS to provide loan guarantees) and the pressures to the banking system (reduced potential of financing organisations to give out loans). In some instances, the private sector is willing to contribute effectively to local carbon reduction initiatives, when there is evidence of market demand, as demonstrated by the cases of the City of Stockholm (mainly in district heating/cooling and RE projects), the GCC (mainly in EE projects in the building sector), and the Upper Austria (in the provision of services). The following suggestions are therefore made:

⇒ *Consider not only prioritising local level energy investments within the Structural Funds, but also giving LRAs the option to further prioritise eligibility of investment based on local needs, thus the flexibility required in order to be able to adjust to market demand.*

⇒ *Create an investment fund dedicated to EE, RE, or decentralised energy generation/smart grids projects, with a view to removing existing obstacles in financing and improving LRAs access to loans and grants.*

Clustering and partnering are evidently crucial for the mobilisation of local actors and the promotion of investments. Clustering is not an obvious exercise;

first, it requires the presence of actors and their availability to participate; second, it assumes the coordinated creation of demand and supply of products and services. Given the existence of relevant outstanding and successful initiatives across Europe, it is suggested that such experiences be assessed in detail through a study to draw a set of ‘success factors’ potentially replicable in other regions.

⇒ *Build on the evident success of existing energy-related clustering initiatives at the regional and local level across Europe to draw a set of replicable success factors and facilitate the clustering processes by the provision of ‘seed support’.*

4.3 Capacity building

Success is often linked to the capacity of the LRA to regularly monitor and evaluate progress. Regular monitoring allows for adjustments to be made along the development path, in the case of medium- to long-term strategies (such as in the Upper Austria case), or to directly assess the impact of the initiative (Gloucester City Council case). Accountability is also closely linked to the credibility of the local authority and so is the use of inventories that are transparent and comparable within a broader context (i.e. national or European). The theory has been investigated by the recent EU co-funded project ‘Regions for Sustainable Change’,⁵⁰ which also produced tools and methods to guide LRAs across the key stages of establishing a baseline, prioritising actions, strategic planning, and monitoring of progress. In general terms, monitoring and evaluation of progress should be a mandatory step in the transition to LCE. Accordingly, it is suggested to:

⇒ *Work towards the adoption of harmonised frameworks for emissions accounting across Europe for local and regional administrations, to facilitate benchmarking as well as the measurement of environmental impact.*

With a view to facilitating benchmarking and given that emissions reduction is obviously not a sufficient indicator of a successful transition to LCE, due in part to the horizontal nature of the interventions needed to reduce GHG emissions, it is suggested to:

⇒ *Work towards the identification of a commonly agreed set of indicators for the assessment of the impact of low carbon energy strategies related to the economic, social and environmental level.*

⁵⁰ RSC [web site](#).

These indicators could, for example, refer to quality of life objectives, level of energy demand by end-users, jobs created within the LCE, etc. The use of these indicators could help both the public administrations to assess their performance and the general public to accept the necessary changes.

4.4 Other framework conditions

None of the four case studies described in detail under Part 2 rely on the use of ICT as the main driver of the transition to LCE; rather, ICT is used as a multiplier factor for LRAs to access more people and facilitate their contribution to the LCE path. ICT plays a key role in the Energy Efficient Neighbourhoods concept for smart cities. However, the concept is still in a theoretical development stage and *'the case for ICT as an enabler of energy efficiency still needs to be fully proved, especially at large scale'* (ELSA Thematic Working Group on ICT for energy efficiency, 2010).

ICT is one of the factors that could potentially improve consumer acceptance of new habits and requirements. The role that energy users can play in flattening the energy demand should not be underestimated in the overall effort to tackle energy savings: in fact, it is not at all coincidental that all described initiatives look at the participation and direct involvement of citizens.

The use of an ICT application, the Climate Account, by the City of Stockholm to provide advice on individual actions towards energy efficiency increase and GHG emissions reduction, is an innovative action but not an isolated example; since the launch of the Climate Account campaign, several other initiatives have been deployed, such as the European Citizen Climate Cup⁵¹ targeting EU households, and the Energy4Life Europe competition⁵² targeting schools in selected EU countries. Moreover, new ICT tools are rapidly emerging, with the future pointing towards the use of social networks together with incentive games concepts (Charalambous A., 2011).⁵³

Behavioural change is the consequence of consumer acceptance. Such change can be made mandatory or facilitated by means of incentives or by providing the evidence that necessary changes bring benefits and advantages besides costs (see 4.3 above). One of the most powerful tools LRAs can use to foster change is to 'lead-by-example'. This is evident in, among other sectors, the construction industry, where public authorities, on the one hand, may be called to take a leading role in refitting their buildings to meet energy efficiency criteria on a

⁵¹ Co-financed by the EC through the IEE Programme.

⁵² Co-financed by the EC.

⁵³ See also the [Eco-innovation Observatory](#) 2011 country profiles.

mandatory basis⁵⁴, and on the other, have the authority to control building development, hence influence the work of development companies towards energy efficiency building practices, such as in the Upper Austria and Gloucester City cases.

- ⇒ *Consider improving the accountability of LRAs to the general public by, for example, developing European guidelines or competitions/prizes.*
- ⇒ *Facilitate the deployment of the ‘lead-by-example’ approach to large numbers of LRAs, by prioritising funding of LRAs implementing relevant measures within the Structural Funds, and by raising visibility of LRAs’ initiatives through national and/or EU-level campaigns.*

Another framework condition that proves to be an important factor in successful initiatives is the potential for the LRA concerned to participate in EU initiatives and programmes. This is not only intended to be the opportunity to access knowledge and best practices or funding, but also to be directly involved in delivering EU policies and vision. Not all LRAs are involved in EU initiatives with the same frequency or intensity; in fact, some are particularly active in this respect, while others lack the capacity or the visibility to do so, often contrary to their political will. Several mechanisms ensuring the fair participation of all interested LRAs in EU initiatives have already been piloted, such as the application of maximum quotas in the number of project proposals that can be submitted by each organisation in a specific call, or the design of programmes for the exchange of experiences between high and low capacity LRAs; however a divide between ‘strong’ and ‘weak’ LRAs in terms of involvement in EU projects is still apparent, especially in the ‘technology-driven’ sustainable energy sector, and several LRAs are still unable to directly benefit from such initiatives.

- ⇒ *Consider developing a scoreboard to monitor the fair participation of all interested LRAs in EU-funded projects in the energy and other sectors, along with mechanisms for the participation of the least visible or knowledgeable.*

For example, one of the mechanisms could be the creation of an incubator for marginalised LRAs lacking the capacity to directly apply for EU calls, where pilot initiatives in carbon reduction would be developed and expert advice in proposal writing would be provided along with networking and other relevant services.

⁵⁴ In the Proposal for a Directive of the European Parliament and of the Council on energy efficiency and repealing Directives 2004/8/EC and 2006/32/EC, the provisions of Article 4(1) point to the renovation, as from 2014, of 3% of the total floor area owned by public bodies on an annual basis.

Appendix I – List of screened cases

Id number	Title	Selection result
1	UK – Low Carbon and Environmental Goods and Services Sector Strategy for England’s Northwest	-
2	DE – Hamburg: European Green Capital award 2011	+
3	UK – London Mayor’s Climate Change Mitigation and Energy Strategy 2010	+
4	PT – Porto: Strategy 2M – <i>menos Resíduos, menos Carbono</i> (Less waste, less carbon)	+
5	IT – The Municipal Energy Programme of Bologna	-
6	ES – Barcelona Energy Improvement Plan 2002-2010 (PMEB)	+
7	IT – Energy Efficiency Plan of the Municipality of Padua	-
8	SE – Biogas <i>Väst</i>	+
9	UK – Milton Keynes Carbon Offset Fund	-
10	DE – The Climate Change Policy of Stuttgart	-
11	BG – Sofia’s Sustainable Energy Action Plan (SEAP)	-
12	SE – <i>Ekostaden Augustenborg</i>	-
13	UK – The Local Climate Change Strategy of the London Borough of Southwark	-
14	AT – Energy 21: the 2 nd phase of the Upper Austrian Energy Concept	++
15	ES – ACO2RDS VOLUNTARIS	+
16	UK – Stroud District Council: Target 2050 strategy	-
17	FR – <i>A.G.I.R. pour l’énergie</i>	++
18	IE – SERVE Project : Sustainable energy for the Rural Village Environment	+
19	UK – The Heads of the Valleys Low carbon Programme	+
20	UK – Yorkshire Forward : Yorkshire & Humber – A low carbon economy leader	-
21	FR – Paris Climate Plan	-
22	NL – New Amsterdam Climate	-
23	ES – City of Madrid Plan for Efficient Use of Energy and Climate Change Prevention	-
24	SE – The City of Stockholm’s Climate Initiatives	++
25	UK – Gloucester City Climate Change Strategy 2010	++
26	LV – Riga city Sustainable Energy Action Plan for 2010-2020	+

27	UK – RE:FIT project (London)	+
28	UK – SCT- Hadyard Hill Community Energy Project	+
29	BE – Ostend, region for clean energy - Power-Link, Belgium	+

Appendix II – List of References

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