

Policy goals and recent developments related to the use of renewable energy sources in the European Union

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ZEMGALES PLĀNOŠANAS



# **ESPON project: Locate** <u>Territories and Low-Carbon Economy</u>

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National experts (case study reports)



#### Research focus: Regions 'contribution to energy efficiency and renewables

<u>Leading question:</u> What can regions (and cities) contribute to a low-carbon economy transition with focus on energy ?

What is the status Energy consumption patterns ? What is the change between 2002 and 2012 ? households, public buildings, economic activities, transport

What are renewable energy potentials in the regions ? Wind, PV and thermal solar, hydro-electric, tidal power, geothermal, biomass and renewable waste

What is the policy making and governance potential of regions in transition ? Case studies, analysis of transition-related policies and measures

What is the impact of EU Cohesion policy on RES-transition?









## Energy Consumption Patterns in Europe

Energy consumption and renewable energy potentials are as diverse as regional prerequisites for LCE transition. **All following variables show great variety:** 

 Climate conditions, topography, built environment and economic profiles as well as legal frameworks, governance structures, stakeholder structures and engagement

For example: The regional pattern of **energy consumption for space heating, hot** water and cooling

- Higher consumption in central and northern European countries and mountainous regions with rather cold climate conditions; economic wealth of the regions
- Between 2002 and 2012 most western and northern European regions showed a decreasing final energy demand for this sector, mainly due to building retrofitting and increasing efficiency of heating systems
- In contrast, many southern and eastern European regions experienced increasing final energy consumption in this end-use sector



#### Example: Residential heating/hot water, energy delivered 2012





#### Residential heating/hot water, energy delivered: Change 2002-12





#### RES-share for residential heating/hot water **2012**





## Renewable energy potentials

For the example of **wind energy**, it can be clearly shown that regions in the areas of the North and Baltic Seas, as well as the Iberian peninsula have a privileged location with high wind energy potential compared to other regions.

**Solar energy**, on the other hand, shows highest potential in southern European regions.

Patterns of energy generation, exploitation rates and their change in the past 10 years differ widely between these two renewable energy sources:

- Considerable increase of wind energy generation largely took place in regions with high and very high potential.
- Contrastingly, PV generation shows dynamic development mainly in less privileged solar regions, while hardly any change is observed in other areas with high solar potential.

These findings highlight the importance of legal and aid frameworks and the contribution from regional stakeholders in their ambition to exploit renewable energy sources.



#### Wind onshore energy potential, MWh/km<sup>2</sup>





#### Wind onshore, change in installed capacity in 2012-2002, MW/km<sup>2</sup>





#### Example: Wind power, installed capacity (MW/km2) 2012





#### Solid biomass, primary energy potential, GW/km<sup>2</sup>





## Analysis of Policies and Measures

Stage 1: Literature review and analysis of national PaMs considering both national and sub-national PaMs using data from EEA

#### Stage 2: Development of regional clusters

- (1) Collect Regional Performance Indicator
- (2) Collect Regional Governance Indicator
- (3) Map regions into the regional typology matrix
- (4) Select clusters of regions

#### Stage 3: Analysis of PaMs within regional cluster

- (1) Match PaMs to regional clusters
- (2) Map distribution of PaM instruments within each cluster
- (3) Select illustrative examples



#### Stage 4: In-depth analysis of 9 illustrative examples of regions.

- (1) Extensive analysis of policy documents and other relevant documentary evidence
- (2) Questionnaire survey with 10-15 key stakeholders in low carbon initiatives
- (3) In-depth interviews with 2-3 key actors in each example region



## Policies and Measures by Country





### Entity Responsible for Implementation





### **Climate-relevant Policies and Measures Grow**



Data analyses of the implementation and regional performance show a strong statistical relationship between the level of regional autonomy and progress towards a low carbon economy



## Regulatory framework for regional transition policies

- The evidence shows a clear relationship between PaMs and international policy initiatives and climate treaties, their impact on EU level policy and how these in turn are transmitted to national level PaMs.
- The differences at the national level in the type of instrument used and the sectors targeted seem to indicate that the regional PaMs are tailored to fit a country's particular physical, regulatory and economic circumstances.
- However, the analysis suggests that there has been limited implementtation of PaMs by sub-national levels of government. Member states reported that 72% of all PaMs have been implemented by national government, and only 6.5% have been implemented by Regional Governments
- Data analyses of the implementation of PaMs show a strong statistical relationship between the level of regional autonomy and progress towards a low carbon economy.



# Regional Case Studies (and Analysis of Existing Studies)

Locate – 5 in-depth case studies: AT – Rheintal, BG – Pazardzhik, DK – Greater Copenhagen, ES – Burgos, UK – Greater Manchester

plus:

Screening of regional case study reports as a source for lessons learned

Project	Title/case studies for
<b>ESPON GREECO</b> Territorial Potentials for a Greener Economy, 2014	Zealand (Sjælland, Denmark), Southern Estonia (Lõuna-Eesti, Estonia), Ruhr Area (Germany), Southern Transdanubia (Dél-Dunántúl, Hungary), Apulia (Puglia, Italy), Malta (Malta), Navarre (Navarra, Spain), Jämtland (Sweden), Cornwall (UK)
<b>CEP-REC</b> , 2014	Allgäu (Germany), Borsod-Abauj-Zemplen County (Hungary), Mazovia Region (Poland), Provincia di Torino (Italy), Regione Friuli Venezia Giulia (Italy), Savinjska Region (Slovenia), Südburgenland (Austria), Trnava Self-Governing Region (Slovakia), Zlin Region (Czech Republic)
EU2020 going LOCAL, 2012	Sörmland Regional Council (Sweden), Örebro Development Council (Sweden), Regional Development Agency of the Ljubljana Urban region (Slovenia), Riga Planning Region (Latvia), Zemgale Planning Region (Latvia), South region of Luxembourg (Luxembourg), Region of Achterhoek (Netherlands), Local Government Yorkshire and Humber, United Kingdom
<b>MANERGY,</b> 2012	Treviso (Italy), Muldenland (Germany), Savinska (Slovenia), Oberlausitz-Niederschlesien (Germany)
<b>Regions4 GreenGrowth</b> 2012/2013	Abruzzen (Italy), Valencia (Spain), Västernorrland (Sweden), Noord Brabant (Netherlands), Eszak- Alföld (Hungary), West Greece (Greece), Maramures (Romania), Prahova (Romania), Lazio (Italy), Sofia (Bulgaria), Norbotten (Sweden), Flevoland (Netherlands), Greater Manchester (UK)



## Regional Case Studies: Urban/Rural Spatial Structures

Rheintal (AT)



#### Burgos (ES)





#### Greater Copenhagen (DK)



Corine Land Cover Europe 2006

Artificial Surfaces



Source: CORINE Land Cover



## Energy Consumption and RES Share





## Room for Action at Regional Level

The **regional level** adds a holistic, cross-sectional perspective and can **act as a transition promoter in an integrated way**.

#### **Successful regions**

- cooperate with the municipal level intensively,
- contribute added value by pooling of resources and finding synergies,
- and provide important linkage between national and European frameworks and the local level actors.
- → A general formal responsibility of regional level institutions (including at least human, if not financial resources) would strengthen regional authorities/actors aiming at implementing transition strategies.





## Most Successful Regional Actions and Policies

- To combine **regional with local implementation partners**, and to make use of synergies of competences and resources.
- To develop **tailored implementation strategies** for different economic sectors, energy sources and spheres of everyday life.
- To consider regions' vastly different geographic and economic prerequisites and actor constellations by developing individual strategies.
- To exchange experiences and good practices between regions and to make use of the impetus of international low-carbon initiatives at regional level.
- To join resources at regional level in order to be able to apply for funding, financial investment aids and research funds.
- To make use of regional actors' presence in the region and regional knowledge.
- To collaborate with the economic sector as a key partner in successful regional low carbon-economy transition strategies.
- To collect relevant information (data, business models, strategies etc.) and inform/involve regional stakeholders.



## Support through EU-Cohesion Policy

- Cohesion Policy is supposed to play a strong role in delivering the Energy Union through projects in the broad theme of "Low-Carbon Economy"
- The current funding period 2014-2020 gives more focus and resources on the shift to LCE than the previous period 2007-2013, nearly doubling the relevant allocations
- Both changes in funding and regulations in the current period are expected to have substantial impact (based on experience)
- Recommendations relevant for transition policies are based on performance indicators, evaluation results and practical experience (case studies, programme managements etc.)



## Energy as Funding Priority in Cohesion Policy

- 2007-2013, out of
  Cohesion Funds,
  energy related priorities
  reached between 1 and
  7 %, differing widely
  between MS
- Energy efficiency and RES were the 2 most important priorities
- highest intensities in Lithuania, Malta,
   Czech Rep., Italy,
   Bulgaria

Intensity of funding allocated for the priority theme energy efficiency, co-generation and energy management in total allocation in EU 27



Source: EU Cohesion Policy – The Thematic Pages http://ec.europa.eu/regional\_policy/themes/index\_en.htm , May 2010



## The Shift to Current Period 2014-2020

Cohesion policy allocations to low-carbon economy investments 2014-2020 compared to 2007-2013 in billion EUR



- Near doubling of low-carbon relevant spending overall (through mandatory minimum spending on LC projects)
- Great variance of allocation between MS (e.g. great increase in Spain from low level, substantial increases in PL, RO, PT ..)

The figure shows the ERDF and CF amounts allocated in the Partnership Agreements (PAs) to low-carbon economy investments 2014-2020, compared to an estimate of similar allocations in 2007-2013.



#### Energy Related EU Investment Aid through Cohesion Funds 07-13

- Energy efficiency and RES projects received between zero and above 100€ per capita in the period 2007-2013
- Highest per capita spending in Convergence Regions
- Higher share of Cohesion Fund money in current period
   2014-2020 (mandatory allocations) expected to nearly double per capita spending on LCE-relevant projects



Regional level: NUTS 3 (version 2013 / version 2006) Source: ESPON Territories and low-carbon economy, 2017 Origin of data: EC, Geography of Expenditure, Final Report, Work Package 13, 2015 CC - UMS RIATE for administrative boundaries Population Data (2011) from Eurostat corresponds to NUTS 3, version 2006

Funding for energy efficiency and renewable energy projects per NUTS 3 region per person, programming period 2007-2013 (Mio. Euro, CF and ERDF) Notes: Data for EU Members corresponds to NUTS 3, version 2006, except HR (NUTS 3, version 2013)



## Complexity: National Policy Frameworks for RES

#### Trends in feed-in tariffs, quota and premiums in EU MS, 2009-2015



- Relevance of investment subsidies differ between MS
- Feed-in tariffs, quotas and tender procedures are of great importance
- Strategy changes 2009-15 create uncertainty
- Competition rules etc. with negative impact on RES development

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## Recommendations for LCE-Transition Policies in EU

- The potential **impact of Cohesion Funds** towards LCE-transition is particularly high in Convergence Regions (East and South)
- Per capita contributions RES-investments, efficiency and grids are substantial and should be increased further
- Based on ex-post evaluation and case study results it is essential to improve the national regulatory frameworks towards LCE-transition and to tailor EU-funded regional programmes to those specific frameworks
- Complexities to be considered are high great variance of national regulatory regimes and tariff structures – <u>and</u> EU rulings & aid schemes
- Practical barriers to implementation are also seen by EU-programme administrators (knowledge, co-financing ...)
- Innovative EU-platforms and processes for promoting LCE-transition are essential and should be expanded and intensified, e.g. the EU Smart Specialisation Platform on Energy, the EU Urban Agenda, the European Network for Rural Development and the European Innovation Partnership



## Conclusions for Regions: How to Support LCE-Transition

- Cities and regions greatly contribute to project development and implementation
- Successful cities and regions use and expand their policy/governance potential
- **Cities and regions have a great impact** in creating framework conditions for low-carbon energy projects (efficiency, renewable energies):
  - a planning of projects and locations, zoning, environmental assessment
  - b demand-side rulings for energy efficiency and RES use (e.g. concessions)
  - c knowledge base development and building networks
  - d financial support or partnership, access to national and EU funding
  - Complexities are high great variance of national regulatory regimes and tariff structures and EU rulings  $\rightarrow$  supportive frameworks needed for regions to act
- Innovative regional platforms and processes for promoting LCE-transition are essential and should be expanded and supported through national and EU policies: e.g. EU Smart Specialisation Platform on Energy (*S3P Energy*) for promoting innovation
  - Public procurement, understood comprehensively, can become a significant innovation and development instrument towards LCE transition

**Quality of life** Social inclusion, participation Healthcare Environment Smart City Vienna Framework Strategy

> Resources Energy Mobility Infrastructure Buildings

#### Innovation Education Economy Research, Technology and Innovation (RTI)

# Energieplan City of Zurich (2030)





# **Spatial Differentiation**

#### 2050



High-resolution modeling with building & energiymodel of the City of Zurich



# Masterplan Energy of Zurich



Stadt Zürich Energiebeauftragter

# Smart City Vienna Framework Strategy RS – integration of partial strategies



# Vienna's 'Smart New Town': Seestadt Aspern





## Energyplanning 'Smart New Town' Seestadt Aspern: Stakeholders / Institutions involved



## Energyplanning 'Smart New Town' Seestadt Aspern: Binding agreements needed



.. based on economic feasibility for investors and citizens !



## **Perspectives – what is necessery for transition**

- Integral database: consumption, production, potential, costs
  → monitoring progress
- Spatially precise and binding strategies integration with other sector strategies
- Supportive national legal and financial frameworks for REStransition – coherent EU-regulations & aid schemes
- Citizens, entrepreneurs, cities and regions as promotors for change make a big difference !



#### https://www.espon.eu/low-carbon-economy

#### Towards a low-carbon economy...



The territorial dimension of the transition to a low-carbon economy is one of the major challenges for European regions and cities. The final report of our project LOCATE highlights the important role of Cohesion Policy on the matter and indicates some successful examples of regional actions and policies that promote local synergies, joining of resources and collaboration with the private sector.

Read the final report and policy recommendations of LOCATE



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