

# Appendix: Emilia – Romagna Region

## Profile

The Emilia – Romagna region is located in the North - East of Italy, covering a surface of about 22.125 Km<sup>2</sup>, whereas Bologna is the capital and counting about 9 provincial geographical areas, with a total population of 4.4 million inhabitants.

The region is also the center of communication routs with motorway and railway networks covering about 1350 km and with 4 airports located in the cities of Bologna, Rimini, Parma and Forlì.

As for the regional Economy, the active people in working age are more then 70% out of which the women activity rate is the highest in Italy, while the unemployment rate recorded in 2015 was under the 8% , compared to a national average rate of 12.8%.

The Economy is highly diversified and integrated, with a total GDP over 146 billion € and a GDP per capita equal to 33.238€, one of the highest in Italy. Also the regional propensity to export is the highest in the country, with about 55 billion €, representing the 37.5% of the GDP and with a value per capita equal to 12.500€.

There are 387,000 enterprises located in Emilia – Romagna and, as in the rest of Italy, the majority of them has less then 10 employees. A large number of companies (about 45,000) belong to manufacturing industry that plays a leading role in the regional Economy.

In more details, the main industrial chains are:

- **Agriculture & agroindustry**, including agricultural machines, food processing equipment, packaging machines and technologies for food preservation, with top brands like Barilla, Granarolo, Prosciutto di Parma, Parmalat and Parmigiano Reggiano.
- **Mechanics & Automotive**, the most important regional industry field, including vehicles, motorcycles and related components, as well as agricultural, oleo-dynamics machines, pumps, robotics, sensors etc...with international well known top brands like Ferrari, Lamborghini, Ducati, Maserati, Tretapack, GD, Sacmi, IMA, VM and Trevi.
- **Health & Wellness**, with some relevant excellencies in Biomedical - Orthopedic prosthesis, Electromedical devices – Pharmaceutical Biotechnology – Bioinformatics and Wellness, with top brands like Alfa Wassermann, Consorzio Biomedicale and Sorin Group.
- **Textile & clothing**, whose main production consists in knitwear, leather good, shoes and ready-to-wear, with top brands like Furla, Max Mara, Piquadro, Testoni and Liu Jo.
- **Building**, including ceramics, building materials and fixture, leader in machines for ceramics production, earth moving machinery, cranes and lifting machines as well as all technological products for building industry, with top brands like EmilCeramica, Iris, Marazzi Group.

In addition to this, Emilia- Romagna is considered a very favourable environment for business and innovation, characterized by the presence of 4 regional Universities, of the seats of national organizations, such as CNR (National Research Council), ENEA (National agency for Energy, Environment and Sustainable Innovation), INFN (National Institute for Nuclear Physics), INAF (National Institute of Astrophysics), INGV ( National

Institute of Geophysics and Volcanology) apart from many private and public research organizations and technology transfer initiatives.

It is important also to highlight that the 18.7% of people aged between 20 – 29 years old are graduated in S&T disciplines whereas the Eu average is around 17.1% and the Italian rate is about the 13.2%.

Nevertheless, Emilia – Romagna is also one of the first region at national level for patents registered at EPO per inhabitants.

An other relevant feature is the strong presence of innovative start ups, about 579 out of which about 107 are academic spin offs.

Finally, ASTER, the consortium set up with the agreement undersigned by the Regional Government, together with all Universities and research organizations has created the *Regional High Tech network*, composed by industrial research and technology transfer structures, namely laboratories and innovation centers. The resulting network of technopoles, almost completed with the only exception of the one located in Bologna that will be ready by 2018, they are all located in the cities of the region, and it is composed by 98 structures, of which 85 are laboratories and 13 are innovation centers, organized in 6 thematic areas (advanced mechanics and materials, building and construction, energy and environment, food, health and ICT).

## **Targets and Tools**

The Emilia - Romagna Region takes on European targets to 2020, 2030 and to 2050 in the field of climate and energy as fundamental elements for a sustainable development of the entire territory

The EU targets to 2030 are:

- Reduction of climate-altering emissions of 40% by 2030 in respect of 1990
- Increase of 27% by 2030 of the percentage share of gross final consumption through RES
- Increase of energy efficiency of 27% by 2030

In order to reach the targets, the Regional Government has elaborated two different kind of scenarios:

- a **reference scenario**: taking into account as for the Regional Energy System, different sectors and different energy resources, based upon current market trends and current public policies, and

- a **target scenario**: to achieve the EU target by 2030 that calls for further measures promoting energy efficiency and renewable sources and deeply influenced by specific external causes like technologies and new EU directives.

The drivers of the Target scenario can be summed up in the following sectors:

### **Transport**

**Electric transport:** electric cars registrations **40%**, hybrid **25%**, buses for local public transport **60%**, commercial vehicles **20-40%**

**Cycle transport:** **20%**

**Public transport:** **+50%** on rail, **+10%** on road haulage

**Goods transport on rail:** **10%**

**Electricity**

RES plants: photovoltaics **+2.500 MW**, bioenergy **+170 MW**

**Heating and Cooling**

**Technologies:** heat pumps, biomasses , high efficiency cogeneration, district heating and cooling, solar, geothermal energy

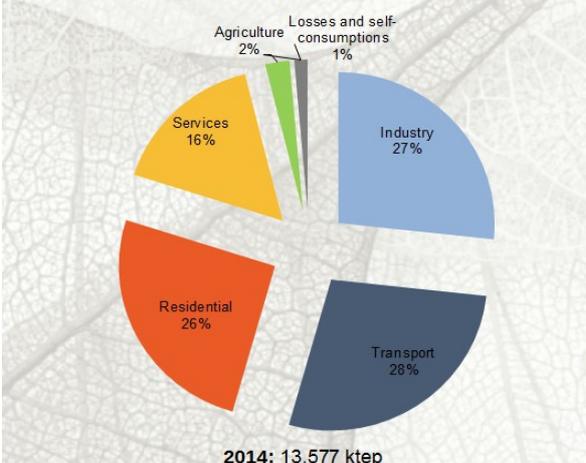
**Renovation and energy refurbishment:** **90%** houses renovated and **30%** houses with higher energy performances

Hereafter some figures resuming the current consumptions in different sectors and the targets to be achieved.

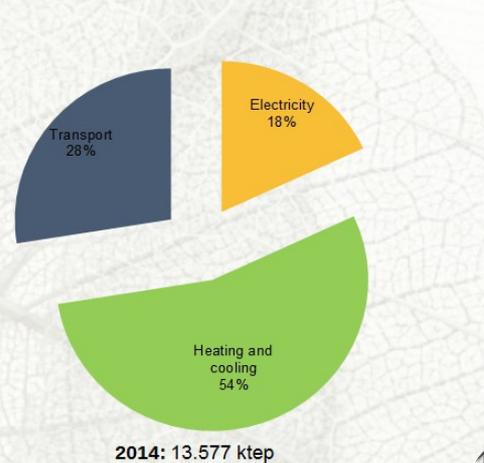
European Target	Medium term (2020)			Long term (2030)			
	EU Target	Status quo (2014)	Reference Scenario	Target Scenario	EU Target	Reference Scenario	Target Scenario
Greenhouse effect reduction	-20%	-12%	-17%	-22%	-40%	-22%	-40%
Energy saving	-20%	-23%	-31%	-36%	-27%	-36%	-47%
Final gross consumption coverage with renewable resources	20%	12%	15%	16%	27%	18%	27%

# Final energy consumption in ER

Gross final energy consumption in Emilia-Romagna in 2014

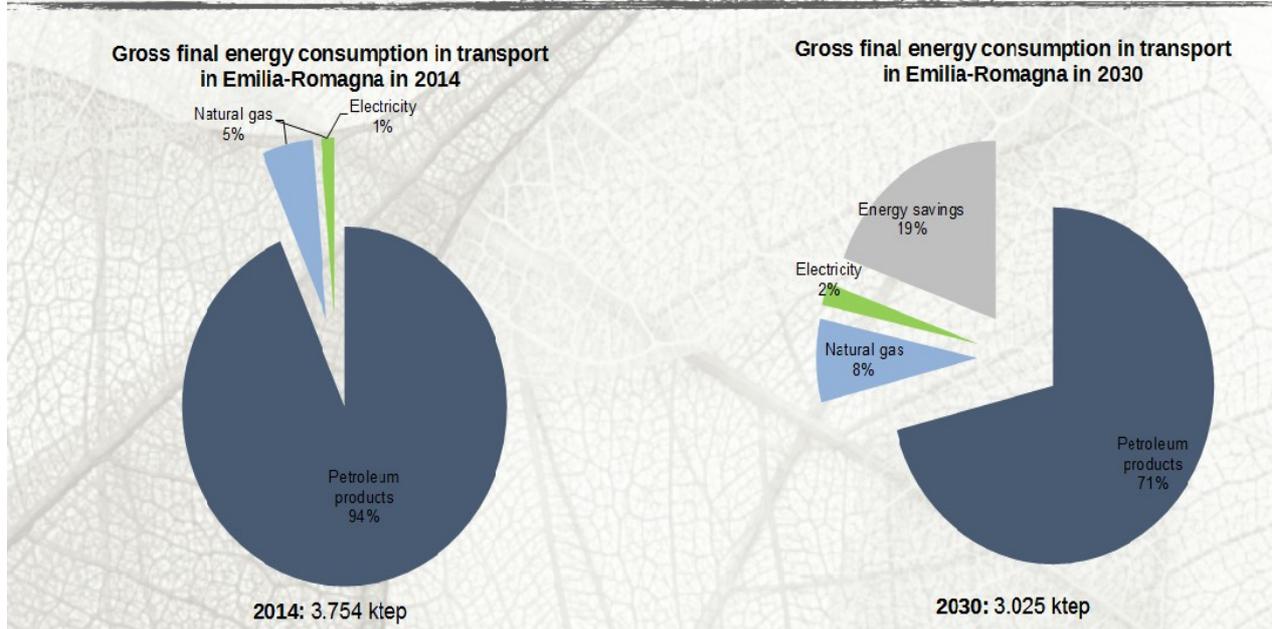


Gross final energy consumption in Emilia-Romagna in 2014

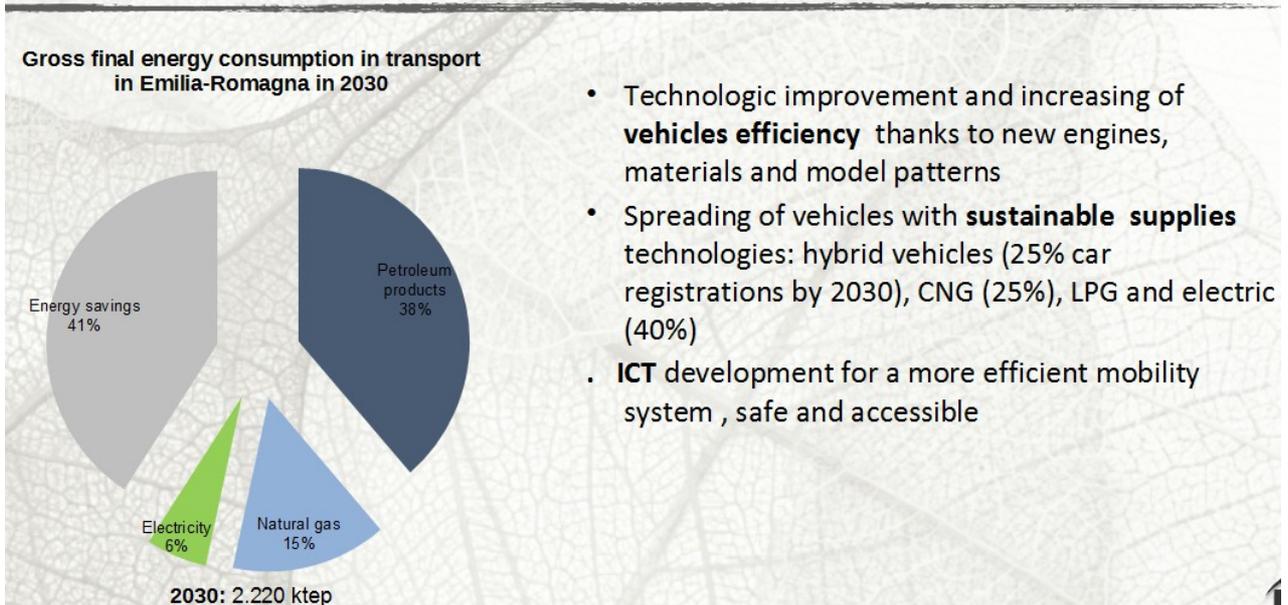


**Note:** Ktep = Ktoe

# Transport: Reference scenario



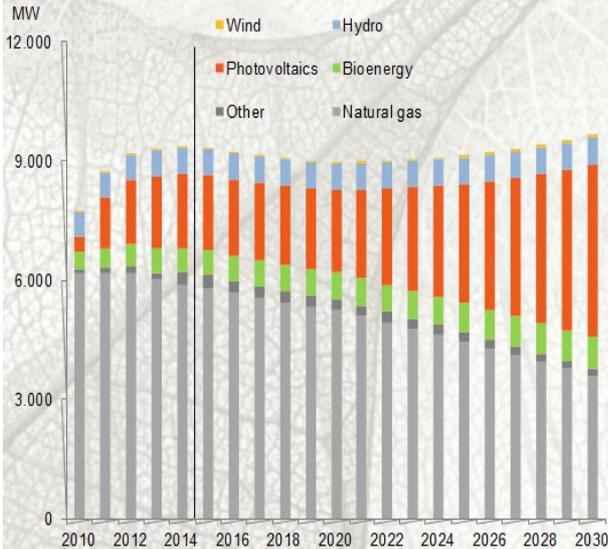
# Transport: Target scenario



**Note:** Ktep = Ktoe

# Renewable Energy Sources (RES) for electric production

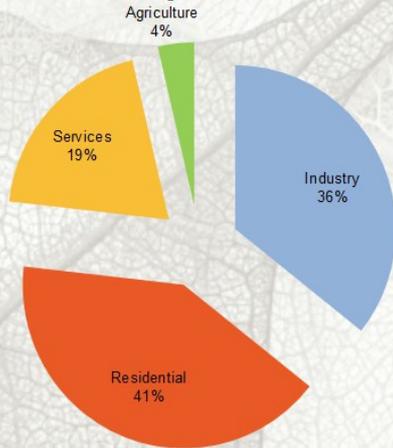
Electricity generation capacity in Emilia-Romagna - Target scenario



Spread of **photovoltaic** and **solar technology systems** (+2,5 GWe between 2014 and 2030).  
 Development of **high efficiency cogeneration**, also powered by **renewable sources** (bio ).  
 Spread of plants using bio-energy (+170 MWe), in a logic of environmental compatibility (biogas, biomass gasification, localization in hilly and mountainous areas )

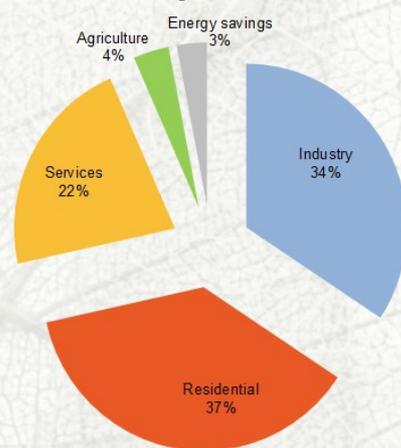
# H&C sector: Reference scenario

Heating and cooling consumption per sector in Emilia-Romagna in 2014



2014: 7.414 ktep

Heating and cooling consumption per sector in Emilia-Romagna in 2030

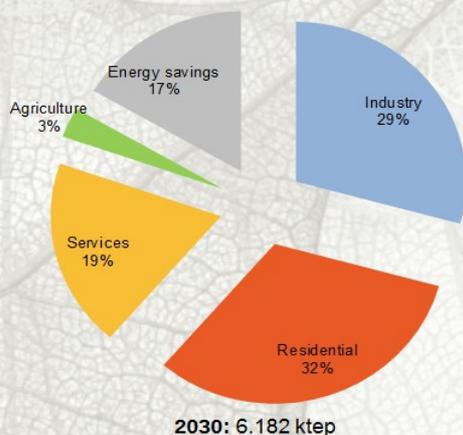


2030: 7.190 ktep

Note: Ktep = Ktoe

# H&C sector: Target scenario

Heating and cooling consumption per sector in Emilia-Romagna in 2030



Penetration of **high efficiency devices** in all fields (eg. Co-generation).

Progressive growth of **energetic building recovery and refurbishment** (in 2030, about 90% of the buildings to be recovered, and 30% in energy upgrading).

Penetration level of **heating technologies** more geared towards to efficient heat pumps and biomass plants (existing or new redevelopment).

Diffusion **systems of control** and management of consumption (in 60% of homes individually heated)

Note: Ktep = Ktoe

## Regional Strategy and Instruments

In order to meet the challenges posed by the EU targets, the Emilia – Romagna Government has drafted a strongly result- oriented strategy that foresees the implementation of specific measures.

In more specific details, the Regional Energy Strategy will implement the followings:

- Saving and efficient use of energy
- Energy production from RES
- Heat from RES
- Smart grid
- Energy razionalization in the transport system
- Green Economy, research and innovation
- Technopoles, incubators, Fab Lab
- Politechnic network
- Communities and local sustainable development solutions
- Vocational training and lifelong learning

The saving and efficient use of energy will be pursued at three different level as hereafter listed:

### ***Residential sector through...***

- Urban regeneration which incorporates energy efficiency
- Minimum energy performance requirements in construction projects and Nearly Zero Energy Building (NZEB).
- Financial instruments and measures to improve efficiency in consumption, especially towards the block apartments.
- Control devices and power management in individually heated homes, particularly in apartment buildings.

### ***Productive sectors:***

- Self-production from renewable sources.
- Recovery of waste heat and dissemination of high efficiency cogeneration.
- Control systems and energy management (eg energy audits, ISO 50001 management systems).
- Financial instruments that optimize the resources than the return on investment
- Ecologically Equipped Productive Area (EEPA).

### ***Public sector:***

- Upgrading of the public administration buildings and of the street lighting.
- Commitment to the implementation of operations on real estate at the Regional level, including the peripheral properties, able to achieve the energy upgrading of at least 3% per annum of the indoor floor area heated.
- Integrated redevelopment of schools, also from the point of view of seismic and the quality of the environments.
- Green Public Procurement and Implementation of MEPS (Minimum Energy Performance Standard) as an environmental policy

### Energy production from RES will consist in:

- RES plants for energy production in self consume or in cogeneration
- Development of innovative technologies from renewable sources for energy production (i.e. hydrogen based technologies, fuel cell energy).
- Regulation for the location of renewable energy plants
- Environmental conflict management in the location of RES

### Heat from RES through the following measures:

- Heat pumps and active solar systems in commercial and industrial building substitution of existing low efficient domestic plants with more efficient biomass feeding plants, considering air quality policies.
- Promotion of high-efficiency cogeneration (micro-cogeneration and distributed cogeneration units such as cogeneration units supplying isolated areas or limited residential, commercial or industrial demands)
- Promotion of high-efficiency cogeneration with accumulation systems and renewable and efficient district heating, in particular with combined heat and power and biomass
- Biomethane, in particular for local transportation.
- Use of geothermal resources of medium and low enthalpy.
- Energy efficiency and consume optimization, cooling of owner building and at community scale.

### Smart grid, implementing:

- Public grid upgrading through smart grid
- Energy accumulator systems for photovoltaic plants (solar accumulators)
- Vehicle to grid systems in public parkings

## Energy rationalization in the transport system, through:

- Sustainable urban mobility planning and design focusing safe pedestrian and cyclist environment and infrastructure; public transportation, electric vehicles.
- Urban infrastructure organised on sustainable public transportation (electric and biomethane).
- Sharing mobility (i.e. car sharing, corporate car sharing, ride sharing) and info mobility.
- Vehicle Excise Duty as Environmental Tax: facilitated tax regime for electric vehicles

## Green Economy: research and innovation initiatives as follows:

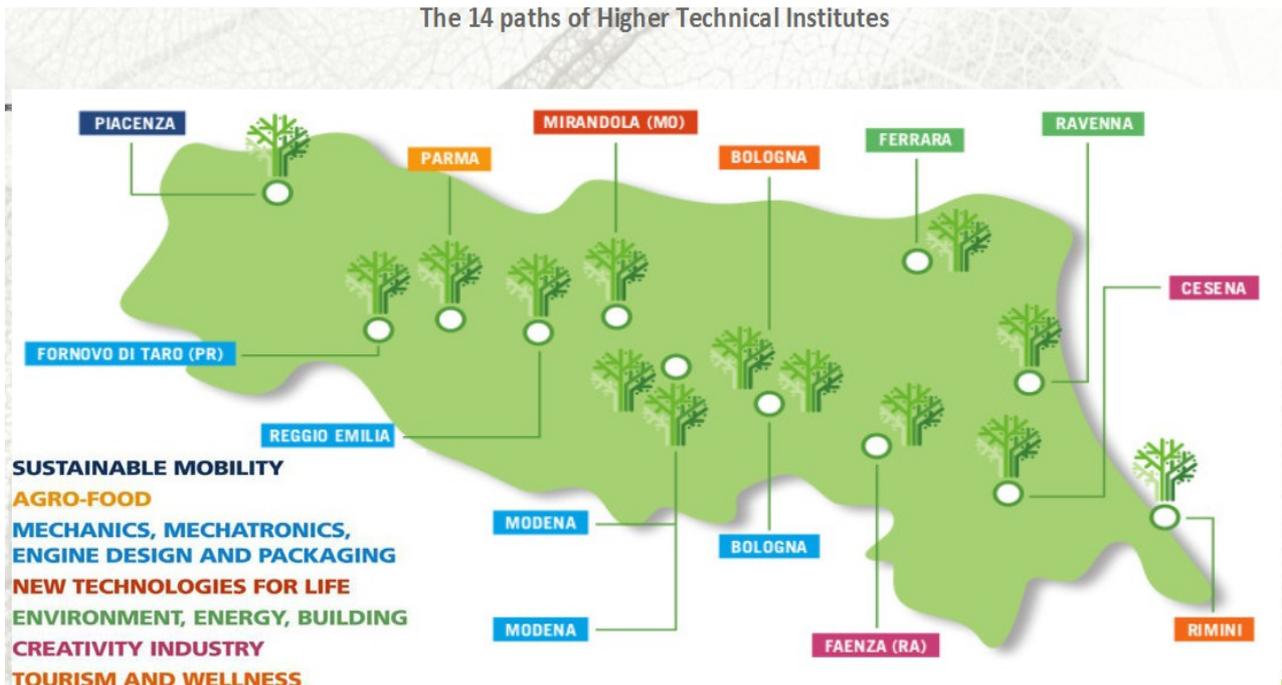
### Emilia-Romagna High-Technology Network:

- R&D on sustainable development
- Green economy networks and clusters
- Industrial Symbiosis: engages diverse organizations in a network to foster eco-innovation and long-term culture change. Creating and sharing knowledge through the network yields mutually profitable transactions for novel sourcing of required inputs and value-added destinations for non-product outputs, as well as improved business and technical processes.
- Circular economy
- GreenER Observatory: analysis and evaluation

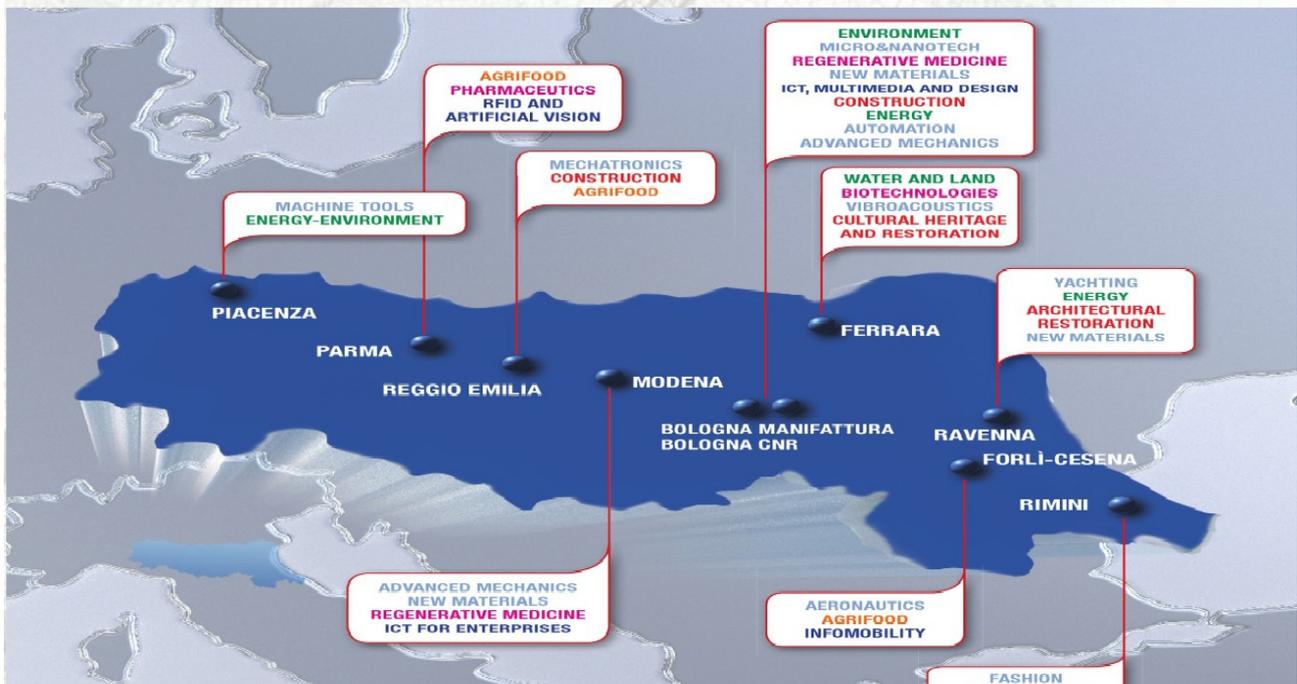
Hereafter some resuming data.



# The 14 paths of Higher Technical Institutes



# Technopoles, FabLab, Politechnic Network



Furthermore, the Regional Strategy for Energy efficiency and saving, foresees also the following actions:

#### Communities and local sustainable development solutions

- Sinergies between local actions and regional planning
- Sustainable Energy Action Plan (SEAP) and Sustainable Energy and Climate Action Plan (SECAP)
- Citizen Participation and Partnerships for Sustainable Development
- Smart city development
- Local Sector Regulation & Administrative simplification
- Territorial & Urban Planning
- Local citizen empowerment involving companies and families
- Energy one-stop-shop
- Schools and Universities
- Information & sensibilization of companies and citizens

#### Vocational training and lifelong learning

- Improving the skills and qualifications of workers is a prerequisite for renewable energy development, which is a high added-value industry with demanding technological aspects. Energy technologies studied are at different levels of development, with a clearer definition of occupations and qualifications in the longer-established energy technologies.
- Continuous training is essential to the creation of qualified and well-paid jobs.
- Identification and assessment of particular occupations must be a shared effort from enterprises, government and workers to provide training in appropriate skills and competences.
- Changing qualification needs in jobs for renewable energies (Upgrading of the Qualifications Framework - Green Job Initiative: Tapping into the job creation potential of the green economy.
- Introducing energetic competencies in all training frameworks
- Creation of high competencies through companies and the Regional High-Technology Network (Master, PhD, Academy)
- Recruiting skilled personnel for renewable energy

Finally, the Strategy is complemented by the **Three-Year Action Plan 2017-2019** whose main topics are the following:

- Development of innovation, training and R&D
- Green economy development & green jobs
- Industry qualifications (agriculture, industry and services)
- Building, Urban and Territorial qualification
- Sustainable mobility
- Sector Rules
- Regional support to local municipalities
- Information sharing, technical assistance for SMEs.

**Budget 2017-2019 available:** 220 million € at regional level  
**+ National incentives, subsidies and tax deductions:** 70-80 million €  
**+ European Measures:** 100 million €