

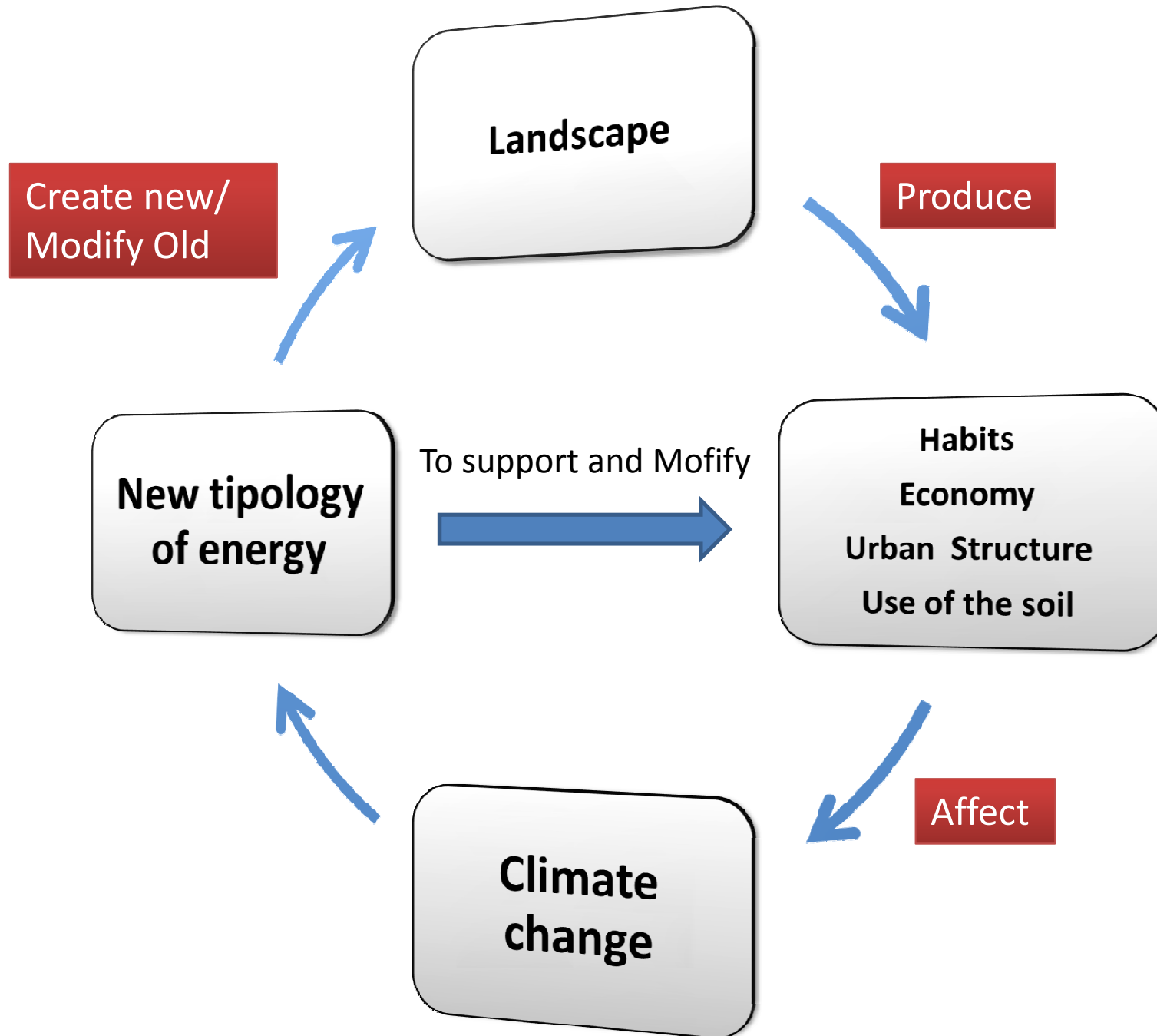
Landscape and Climate Change

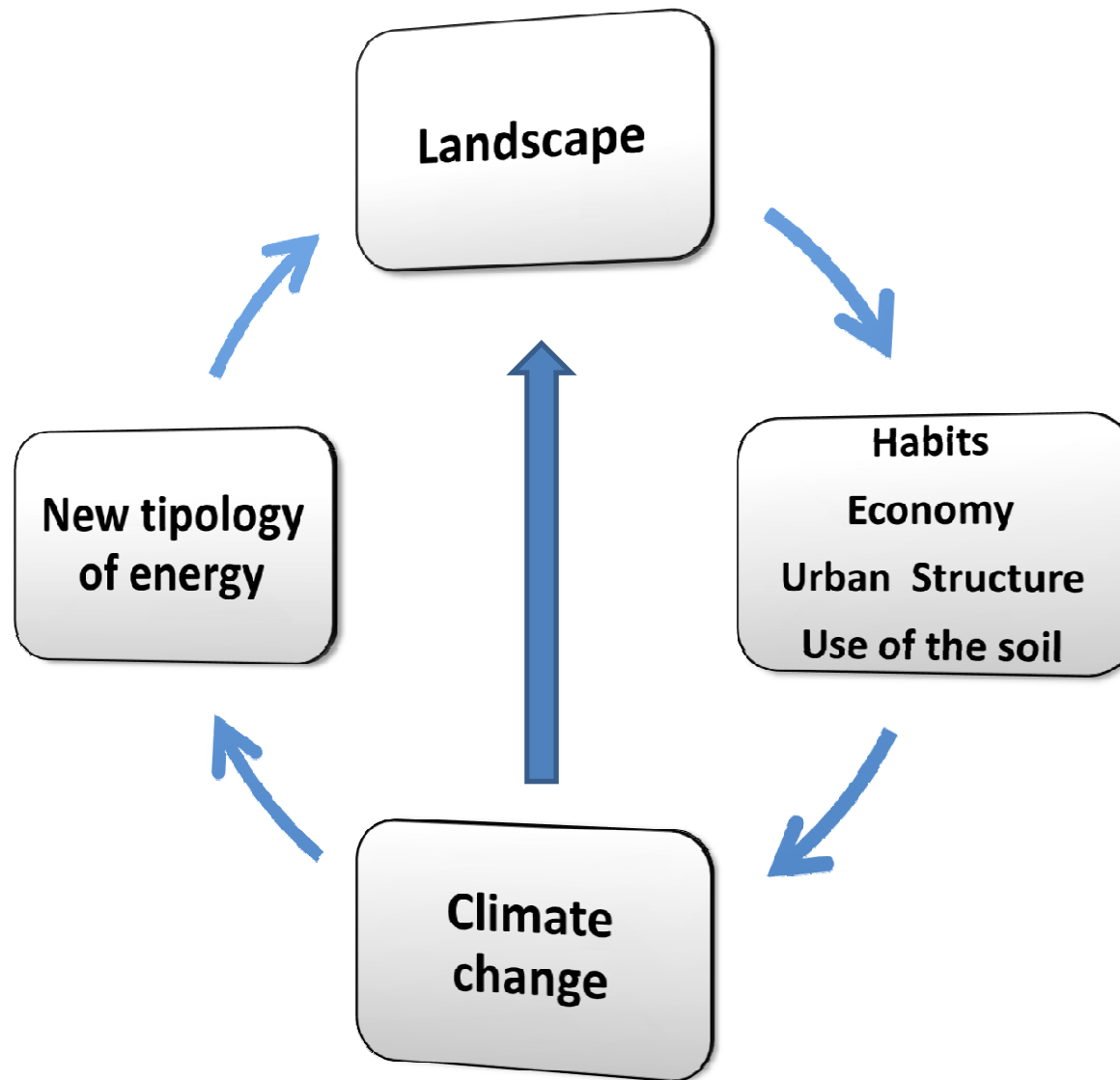


Mai hi he trobat aquells canvis tan lamentables que sofreixen altres comarques per causa de fer-s'hi reformes.

Enric Galwey







Climate Change affect the Landscape **BUT NOT NECESSARILY** change the Landscape

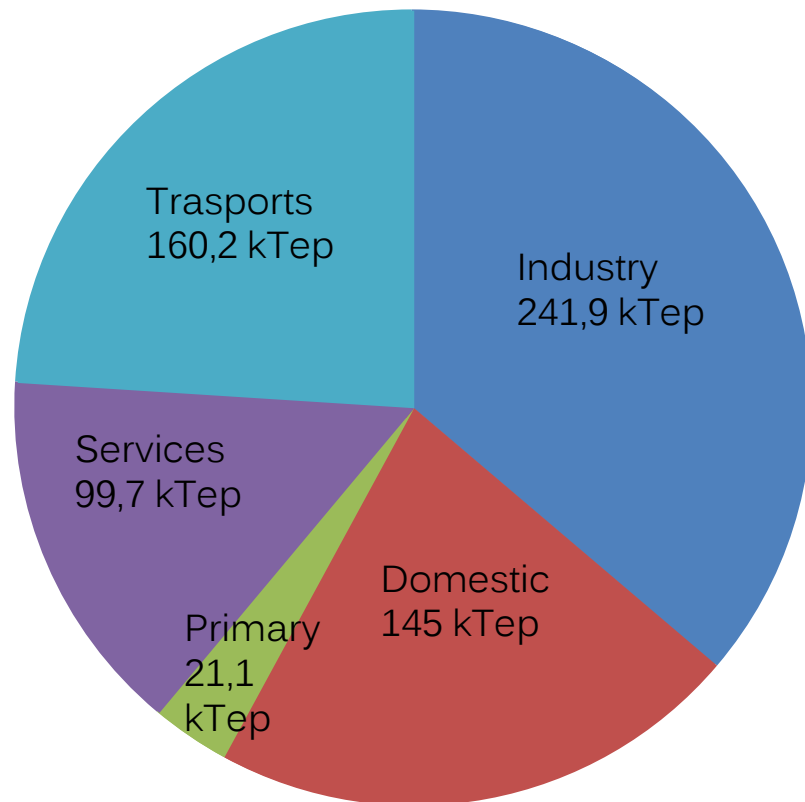


Same Image - Different use of Soil /Structure/Culture

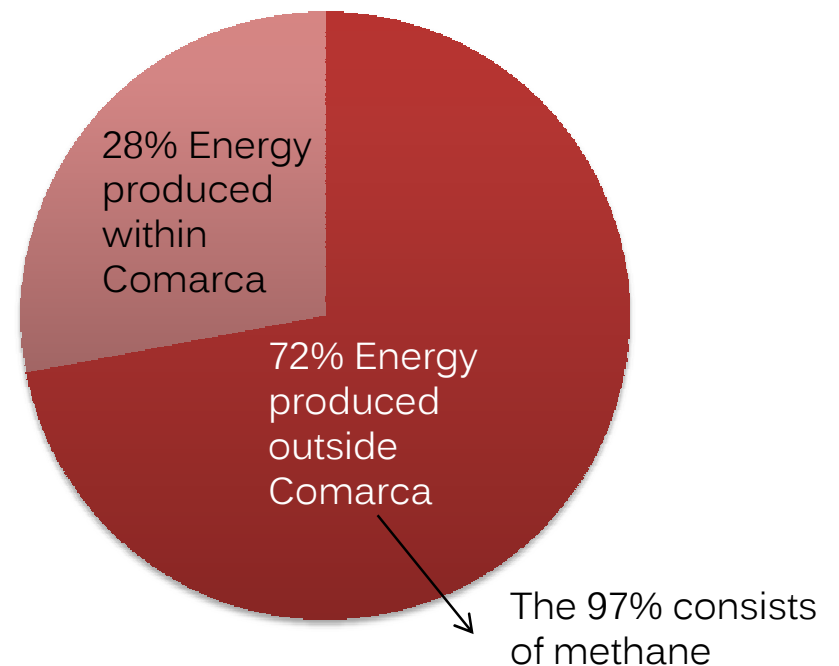
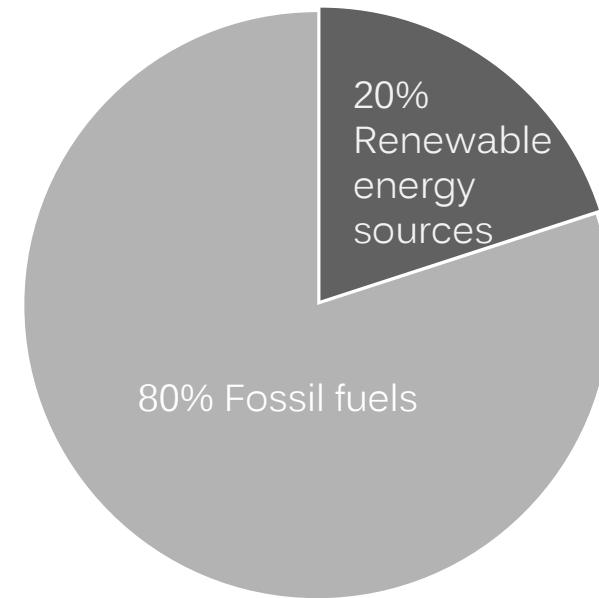
Some Data

- Population Vall d'Olot: 41146 inhabitants
- Energy needs Vall d'Olot: 0,16 Tw/year
- Daily per capita requirements Vall d'Olot : 11kw

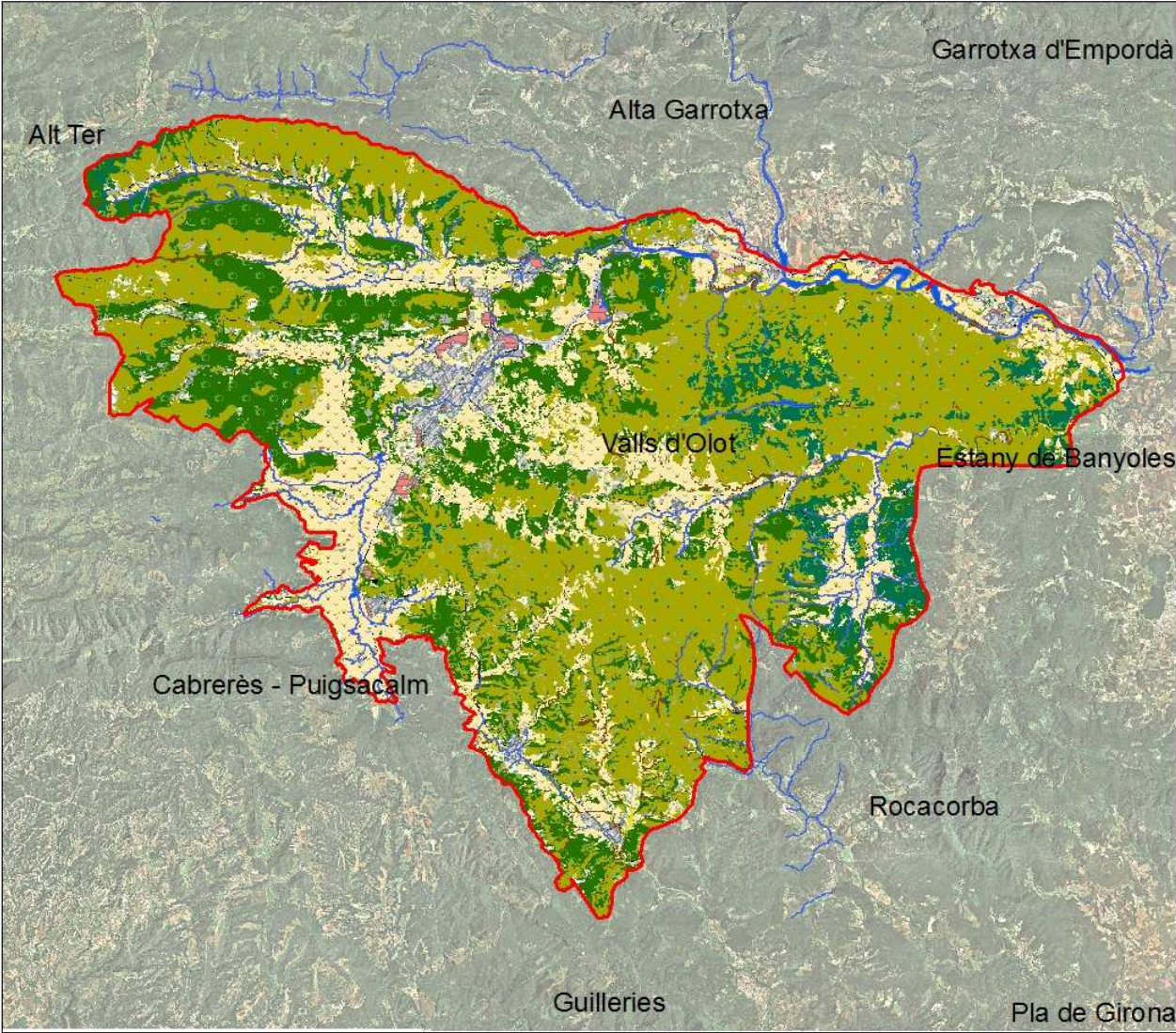
Energy Consumption by Sector



Energy Situation in Garrotxa



Use of Soil



Legend

- Beech
- Cropland
- Broadleaf forest
- Pine forest
- Scots pine plantations
- Oak forest
- Grassland
- Chestnut forest
- Urbanized
- Hidrogràfic System



SWOT ANALYSIS

STRENGTH

Good territory for use of renewable energy

High presence of natural fertilizers (undergrowth)

Good resilience of urban centers (green system, color of buildings)

Good presence Hydroelectric (River Fluvia), and of cogeneration plant

OPPORTUNITY

Reduction the necessity of energy by foreign countries

Implementation of technologies for the use of renewable resources present

Policies that aim to achieve target of CE/ 2009/28

Smarts grids

Reduce dissipation of energy using technology of energetic saving

WEAKNESS

Less use of renewable energy potential

Lack of communication between technical staff and citizens

Not yet evolution of signature as concerned the "Covenant of Mayor"

Absence of policies and incentives

People aren't ready to change their habits

THREATS

Increasing of Built up requires of more energy demand

Extreme event of Climate Change could be dangerous as concerned the development of Energy

The increasing of environmental pollution could damage the richness of Natural park

Lower competitiveness of users as concerned demand of energy

No participation of stakeholders to achieve the goal

A2

Temperature: +1,2C°

Precipitation: between -12% of -15%

Annual rainfall intensity variation: between 750mm of 1250mm

Population: + 20%

Energy: 8-10%

Temperature: +0,8C°

Precipitation: between -5% of -7%

Annual rainfall intensity variation: between 500mm of 1700mm

Population: + 8%

Energy: 4-5%

SCENARIOS

B1

CONSEQUENCES

Urban cores:

- Preventing heat island effect in urban centers
- Increasing water demand for irrigation of urban green

Population:

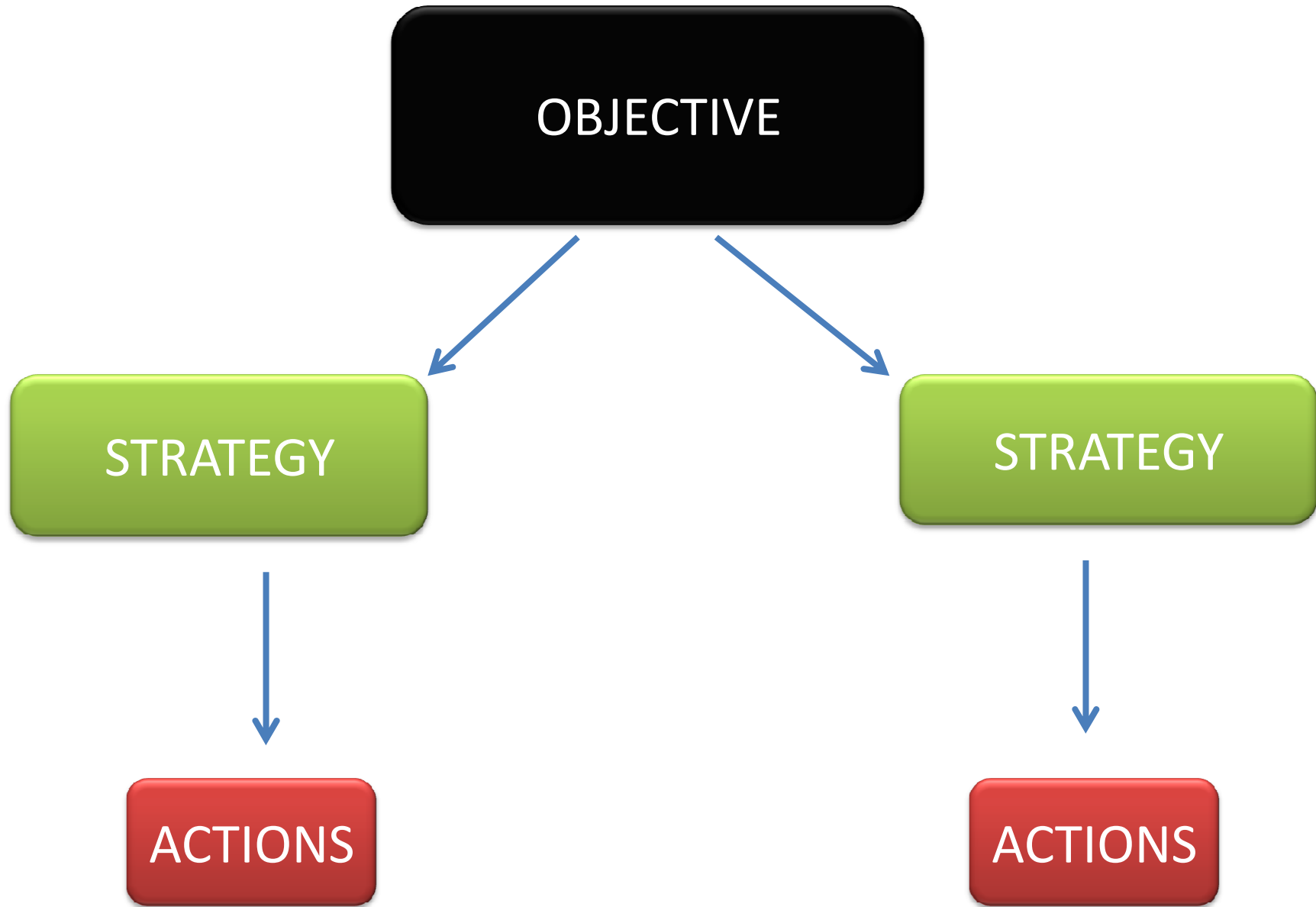
- Increasing people's sensitivity to the issue of global warming
- Local air conditioning demand increased public and private sector and increasing per capita consumption
- Decreasing availability of water

Agriculture:

- Increasing consumption of water
- Decreasing availability of water
- Possible replacement of traditional culture with a crop of energy

Energy system:

- Decreasing availability of water for hydroelectric, geothermal and biomass cogeneration
- Hazard during extreme rainfall events



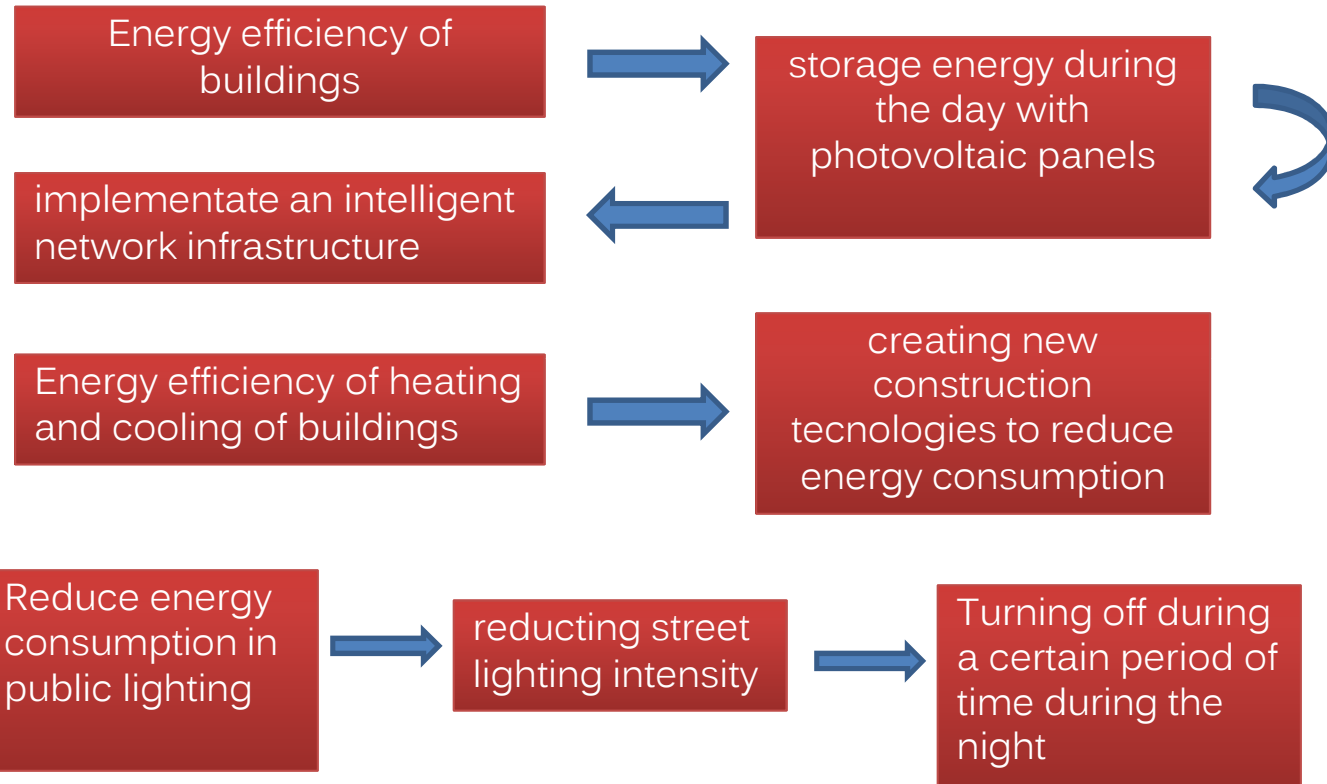
Target

Make the territory more resilient for the energy scenarios of 2050

Strategy

Reduction of consumption

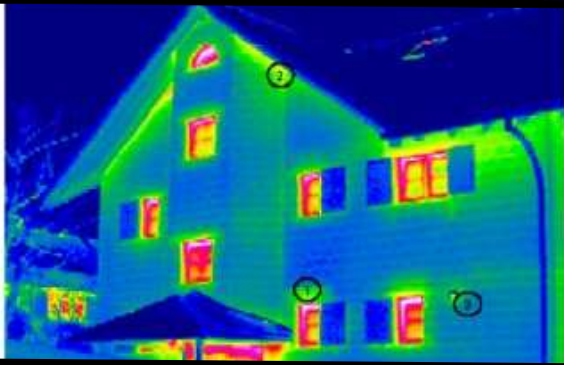
Physical actions



Theoretical actions

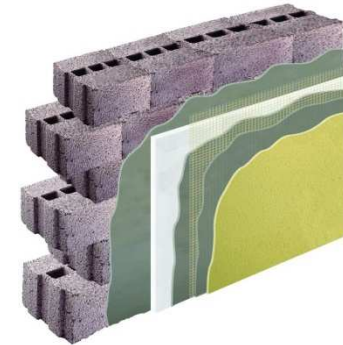
Education, information, training and public awareness

Energy efficiency of buildings



Energy efficiency of heating and cooling of buildings

Improved thermal insulation of buildings



Reduce energy consumption in public lighting

Target

Make the territory more resilient for the energy scenarios of 2050

Strategy

Harnessing renewable resources in the area

Physical actions

Production of energy from forest biomass

Installation of small biogas plants in the territory

Making short chain from biomass generated by grazing animals

Installing photovoltaic systems on roofs of buildings

Installation of biomass cogeneration plants

Trigeneration installation of public facilities (eg new hospital)

Theoretical actions

Incentives for the production of renewable energy

Criteria

	Biomassa/Biogas	Solar	Geothermal
Naturalization			
Camouflage	Industrial archaeology recovery		Installation works below ground
Concealment			
Contextualization			
Separation		Solar roofs	Realization in new buildings

Characterization

SOCIAL

Territorial	Biomass	There are a lot of forests It's more efficiency
Local	Solar energy	People can use this technology on their own
Punctual	Geothermal Energy	It's a new technology and It could improve in the long run



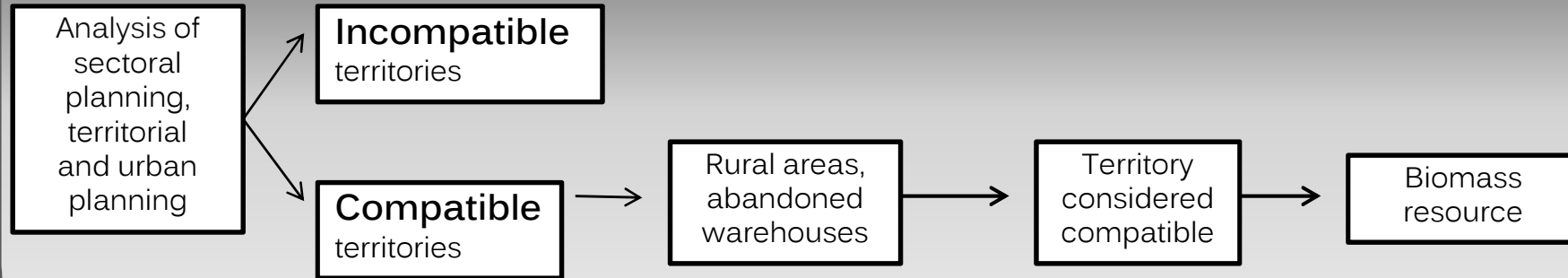
Can be used on roofs of homes and existing and new buildings	Solar energy	Territorial
It need of space and network	Biomass	Local
It 'a technology which is best for new construction	Geothermal Energy	Punctual



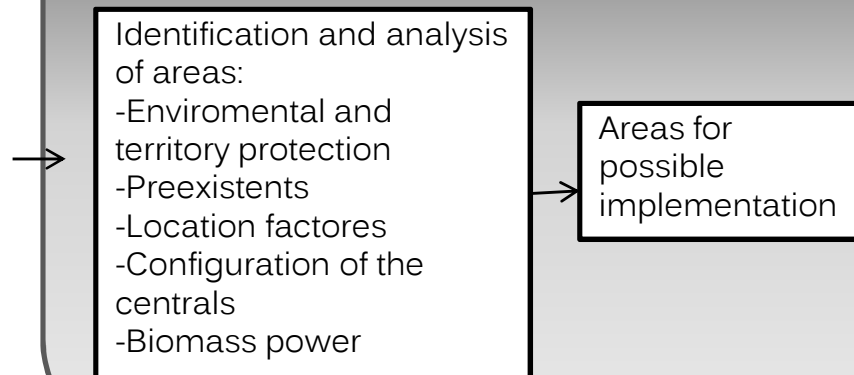
ACCESSIBILITY

Biomass

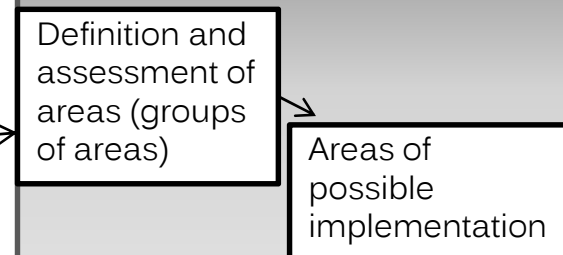
Step 1: Identification of areas for possible implementation



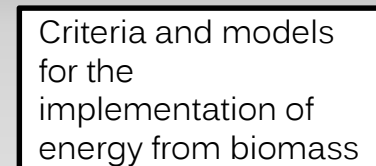
Phase 2: Analysis of the areas likely to be implemented



Step 3: Define areas of implementation



Step 4: Criteria for the management model



Biomass plants
(1-5MW)
Reuse of
industrial
archeology



Forest area of
Vall d'Olot:
28700 ha



Usable
surface 8500
ha



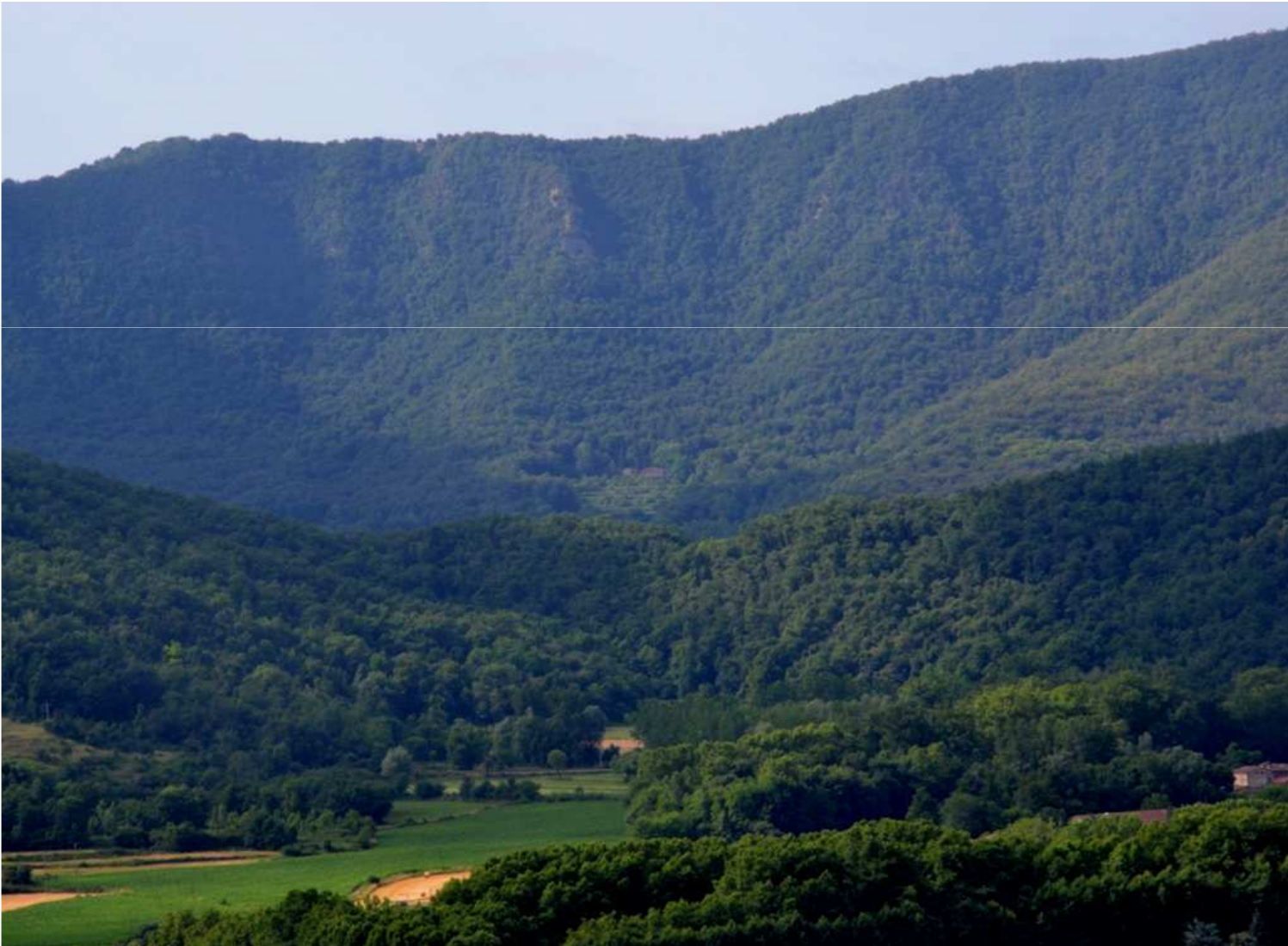
Combustion of
the dry
cleaning of
undergrowth



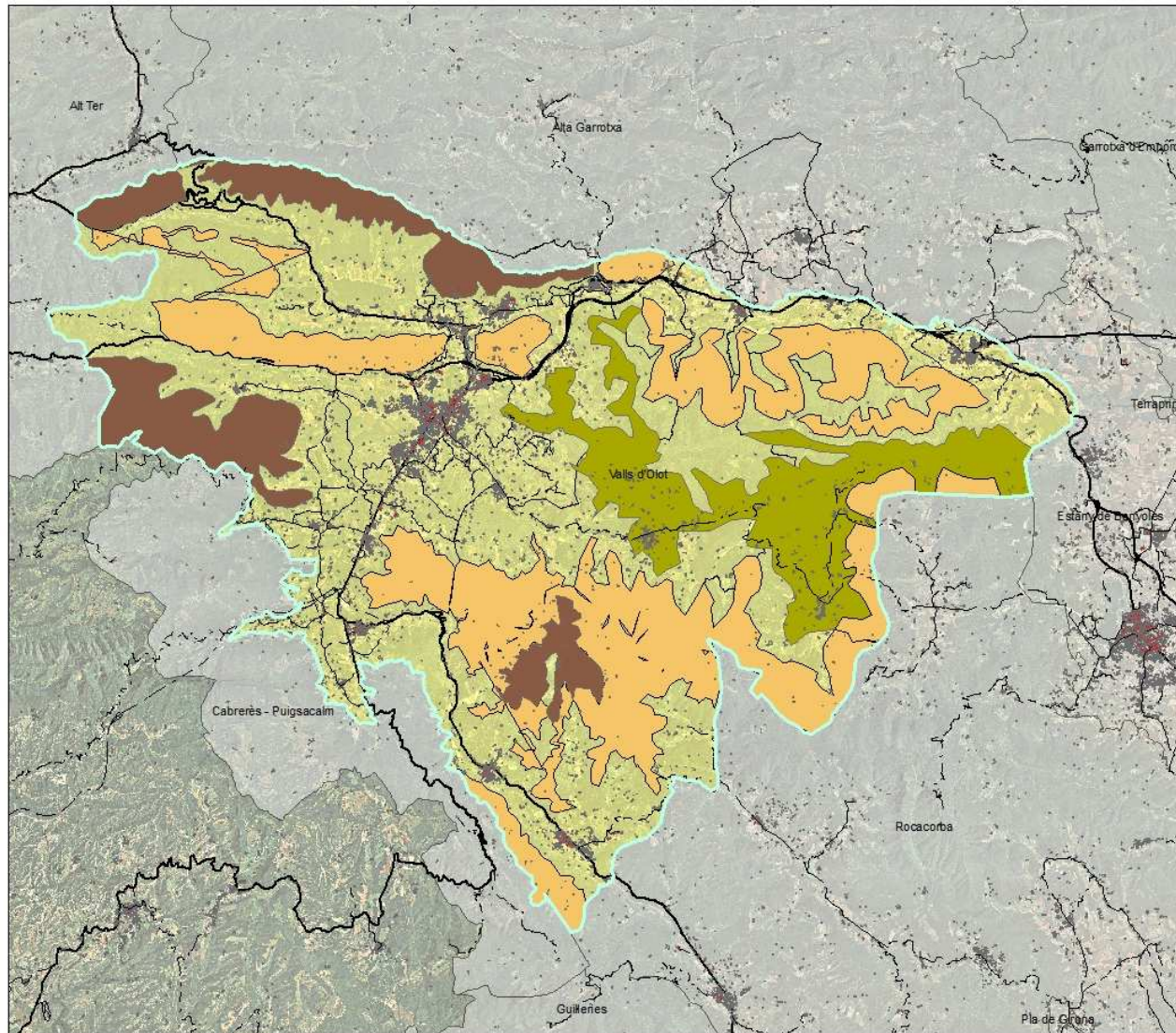
Possible
energy
production
28 MW



Annual
requirements
covered 25800
inhabitants



Vall d'Olot



No Biomass Area

 Olot Valley

Slope

 20-25

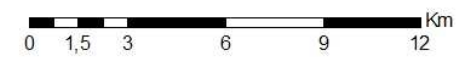
 25-30

 >30

 Main Road system

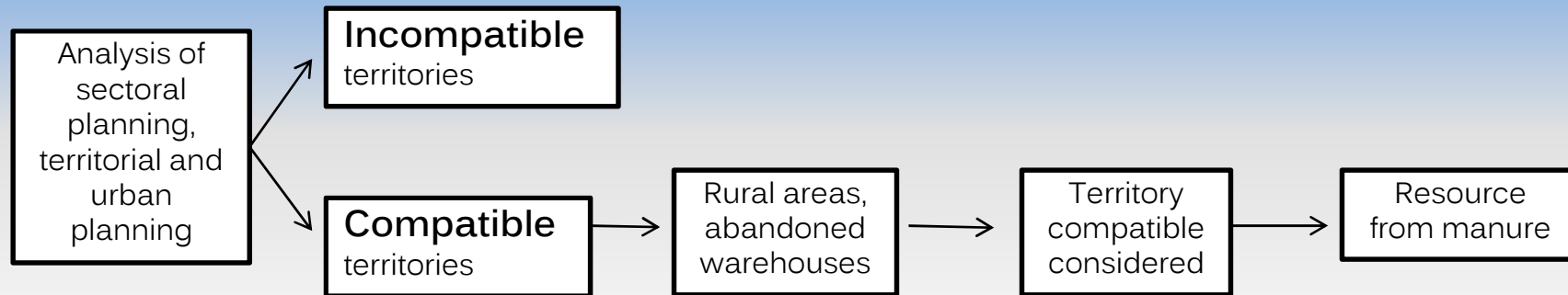
 secondary road system

 existing built

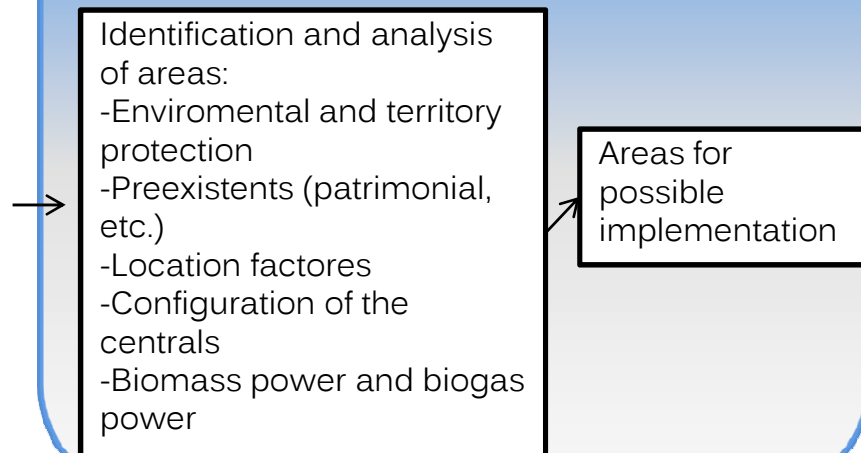


Biogas

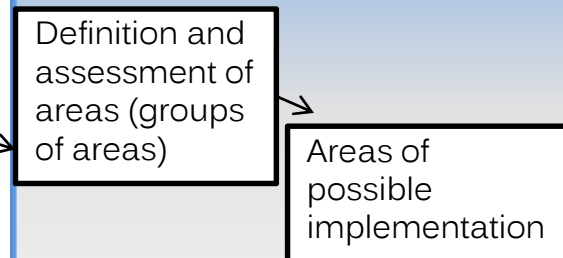
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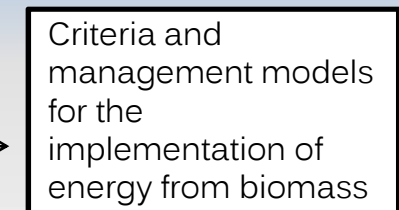
Phase 2: Analysis of the areas likely to be implemented



Step 3: Define areas of implementation



Step 4: Criteria for the management model

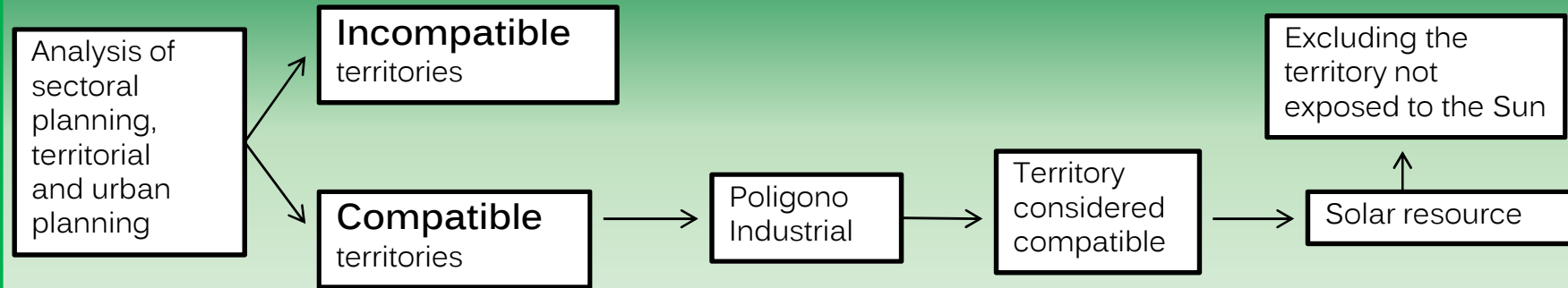


The territory enjoys great potential as regards the production of natural gas from cow manure, but currently do not have sufficient documentation to determine the amount of methane produced from these farms. It needs to study other practices such as in Spain and in Italy.

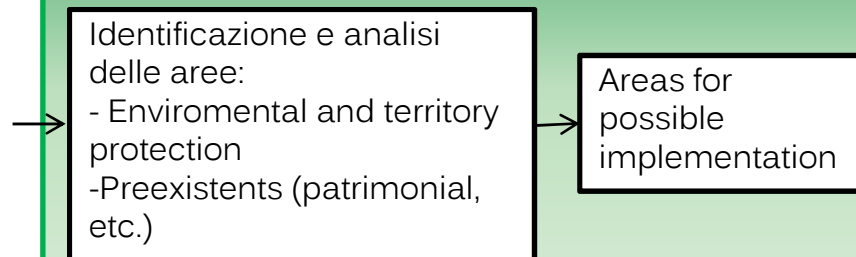


Solar energy

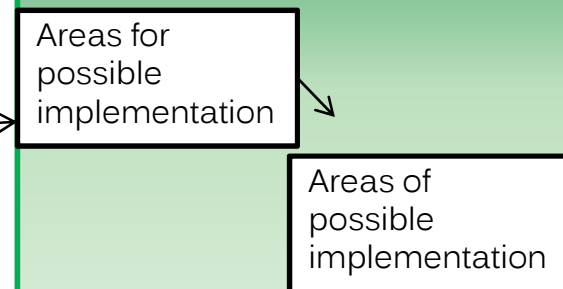
Step 1: Identification of areas for possible implementation



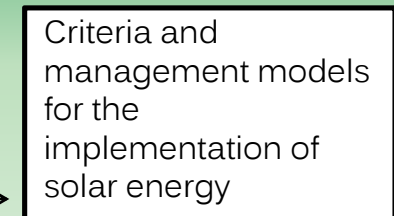
Phase 2: Analysis of the areas likely to be implemented



Step 3: Define areas of implementation



Step 4: Criteria for the management model



Installation of photovoltaic panels on the roofs of industrial areas



Industrial area of Vall d'Olot :
173 ha



Possible surface covered
500000 m²



Installation of PV systems:
multicrystalline



Possible energy production
600 Mwh

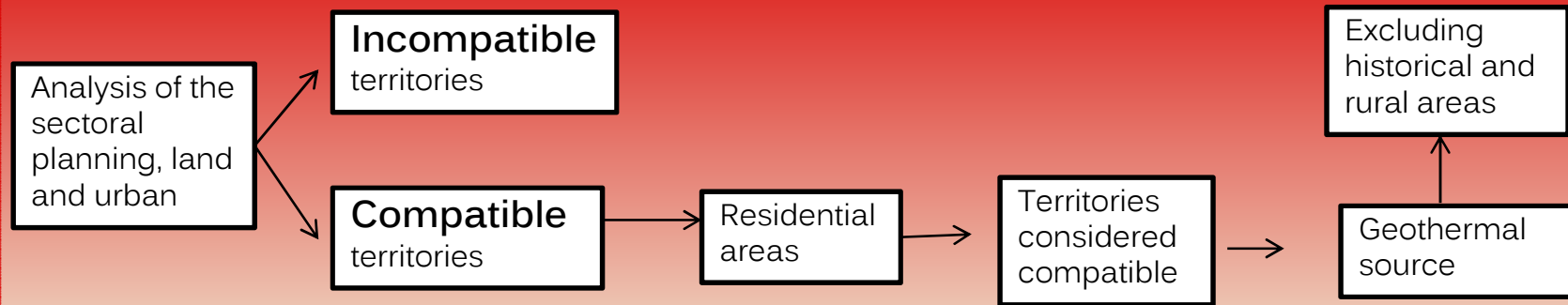


Requirements covered in the time of peak
500000 users
(domestic and industrial)

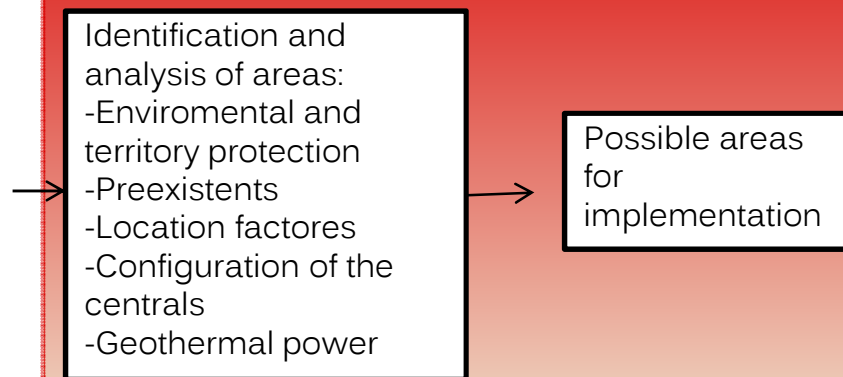


Geothermal Energy

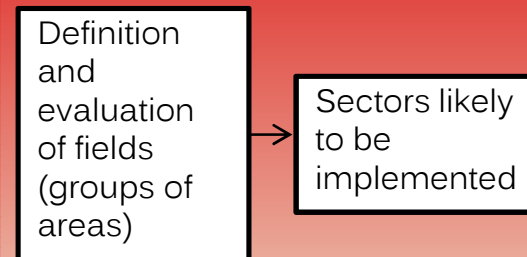
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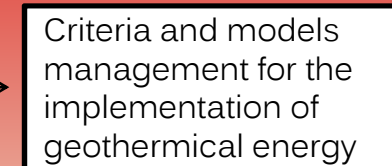
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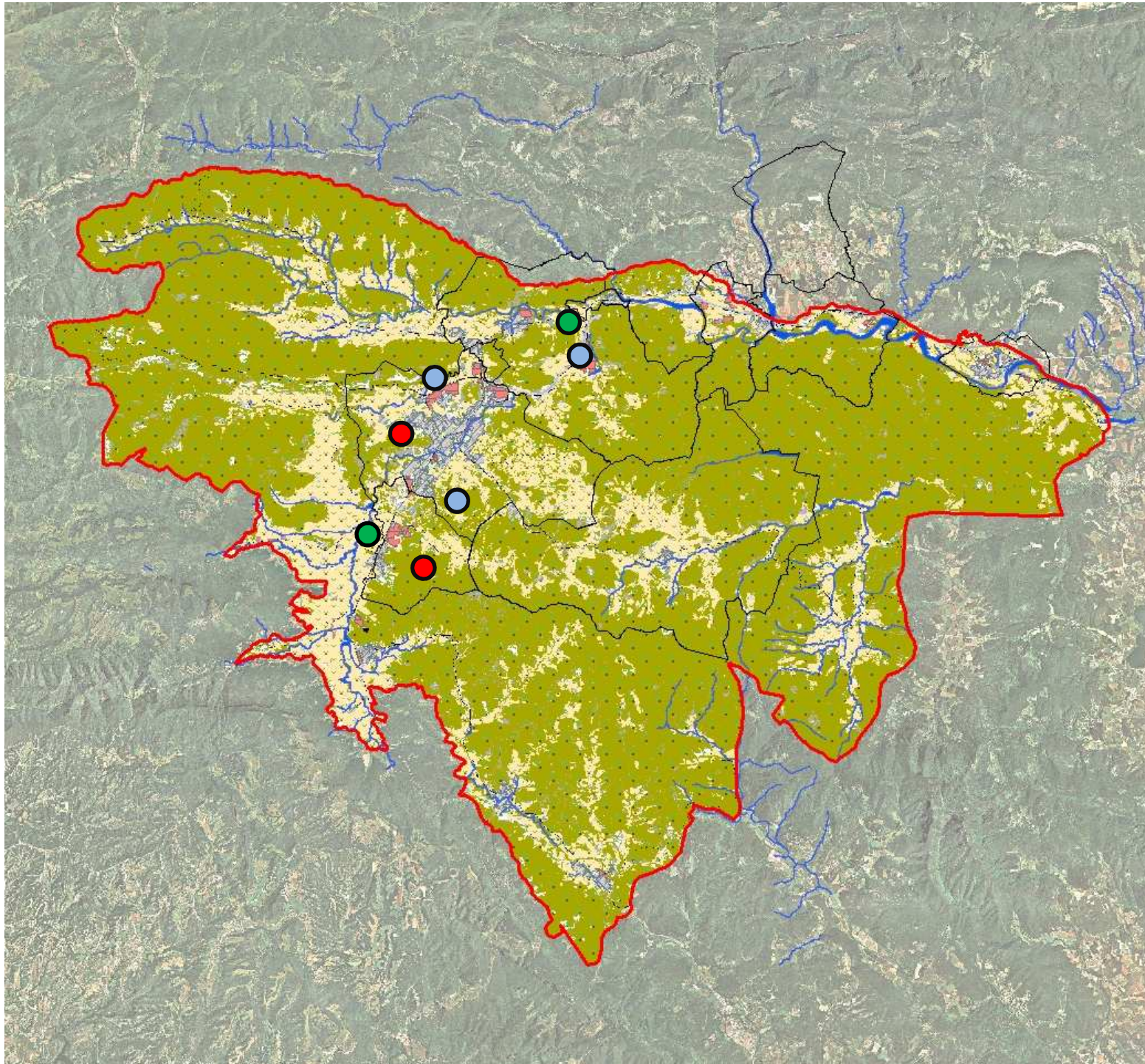


Step 3: Define areas of implementation



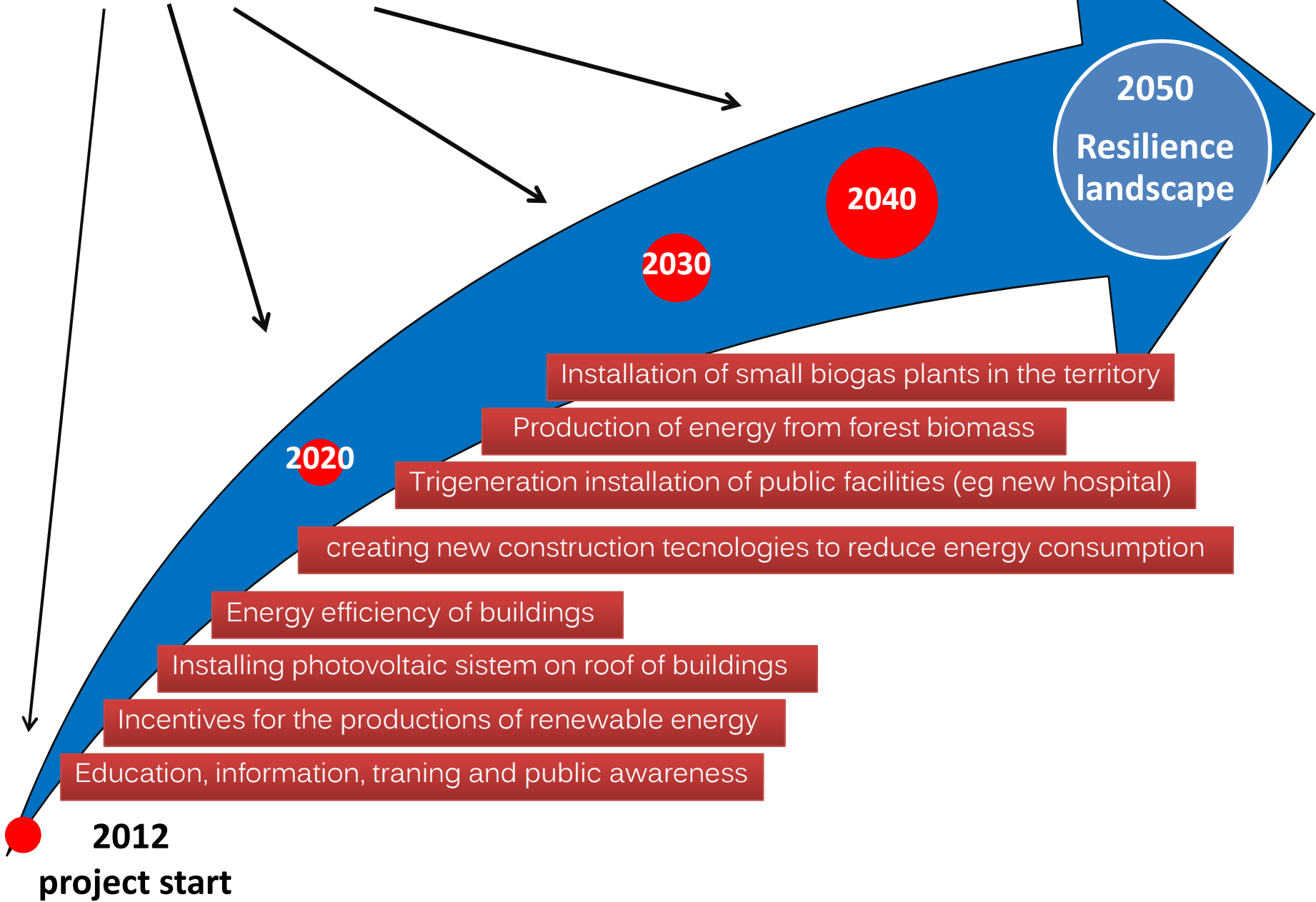
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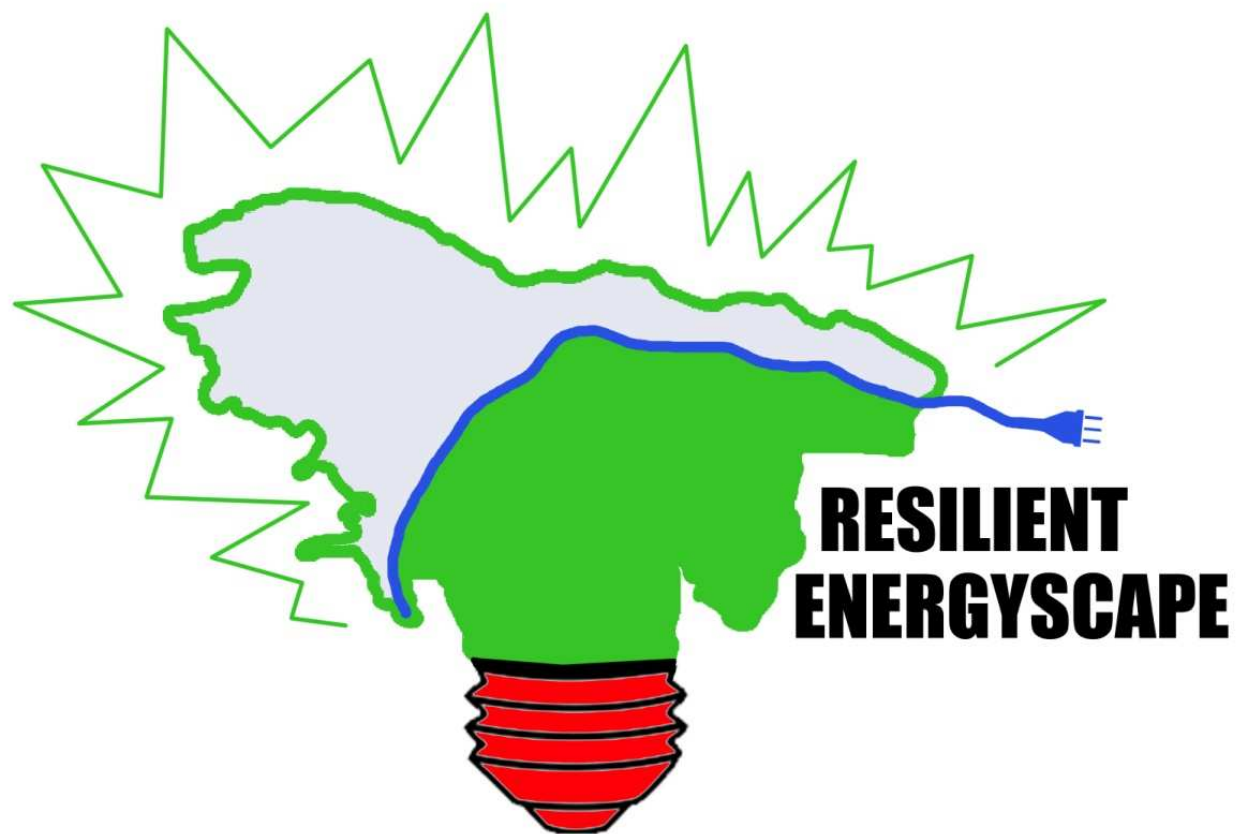




- **Photovoltaic energy:** photovoltaic solar panels installed on the roofs of buildings in the town centre of Olot devoid of historical value
- **Biomass/Biogas energy:** installation of small biomass plants (wood and animal manure) from 1MW to 5MW in agricultural areas, exploiting if possible abandoned or decommissioned buildings outside the urban cores.
- **Geothermal Energy:** geothermal energy exploitation low enthalpy for new buildings or for cases heavy restructuring.

Monitoring of renewable energy on the territory





***Everything is a series of miracles of the confluence of white foam,
the red soil of the basalt gray, blue sky and green mountains. Joaquin Danes i torras***