

# The Societal Impacts of Sustainable Energy Action Plans (SAEP)

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*Fourth International Conference on Degrowth for Ecological  
Sustainability and Social Equity*  
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# The genesis ...

- ▶ **Ecological macroeconomics**

- ▶ “*Transition to sustainability? Feasible scenarios towards a low-carbon economy*”, by Giovanni Bernardo and Simone D’Alessandro (2014)

<http://mpira.ub.uni-muenchen.de/53746/>

- ▶ Peter Victor’s question: How can we manage our economy without growth?
- ▶ Our question: Which are the **dynamics** that the transition to sustainability would provoke to the socio-economic system?
- ▶ A bit more precise: *How will the goal of 80% reduction in carbon emissions by 2050 with respect to the 1990 level change our life?*
- ▶ Our answer: No idea! But for sure such a transition will **shake** our socio-economic system.

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## Transition to sustainability? Feasible scenarios towards a low-carbon economy

Bernardo, Giovanni and D’Alessandro, Simone (2014): *Transition to sustainability? Feasible scenarios towards a low-carbon economy*.



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### Abstract

This paper analyses different policies that may promote the transition towards a low-carbon economy. We present a dynamic simulation model where three different strategies are identified: improvements in energy

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# Some lessons

Deep uncertainty and trade-offs

TRADE-OFFS



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## Some lessons

Deep uncertainty and **TRADE-OFFS**

No win-to-win strategy

How to choose?



## Our idea ... *not only our*

- ▶ Sustainability must consist not only of ecological constraints, but also of social issues.
- ▶ Who can define the social constraints?
- ▶ Given the trade-offs among different social attributes, we hope in a democratic process which determines the path, the winners and the losers.
- ▶ Sustainability is a political concept, an agreement in a direction, which may also change along the transition itself, given the huge changes in the system (e.g. the emergence of new institutions and the new power relations in the society).

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# What can we do now?

We can shrink the analysis to the local scale, where top-down decisions are strictly linked to the territory.

Where, hopefully, citizens and their Mayor share the same streets, the same bars, the same life!

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# Sustainable Energy Action Plan (SEAP)

<http://www.covenantofmayors.eu/>



**Covenant of Mayors**  
Committed to local sustainable energy



About

Actions

Participation

Support

Media

## Sustainable Energy Action Plan

A Sustainable Energy Action Plan (SEAP) is the key document in which the Covenant signatory outlines how it intends to reach its CO<sub>2</sub> reduction target by 2020. It defines the activities and measures set up to achieve the targets, together with time frames and assigned responsibilities. Covenant signatories are free to choose the format of their SEAP, as long as it is in line with the general principles set out in the Covenant SEAP guidelines.

5, 939 Signatories and 189, 632, 495 European inhabitants are involved (up to yesterday!)

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# Sustainable Energy Action Plan (SEAP)

- ▶ By their commitment, Covenant signatories aim to meet and exceed the European Union 20%  $CO_2$  reduction objective by 2020.
- ▶ Within predefined time frames, they formally undertake to fulfill the following:
  - ▶ Develop adequate administrative structures, including allocation of sufficient human resources, in order to undertake the necessary actions;
  - ▶ Prepare a **Baseline Emission Inventory**;
  - ▶ Submit a Sustainable Energy Action Plan within the year following the official adhesion to the Covenant of Mayors initiative, and including concrete measures leading to at least 20% reduction of  $CO_2$  emissions by 2020;
  - ▶ Submit an implementation report at least every second year after submission of their Sustainable Energy Action Plan for evaluation, monitoring and verification purposes.

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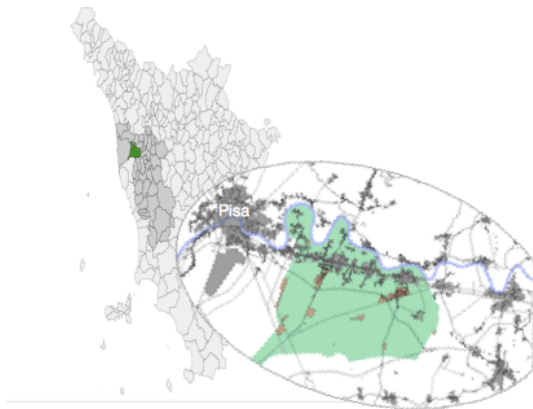
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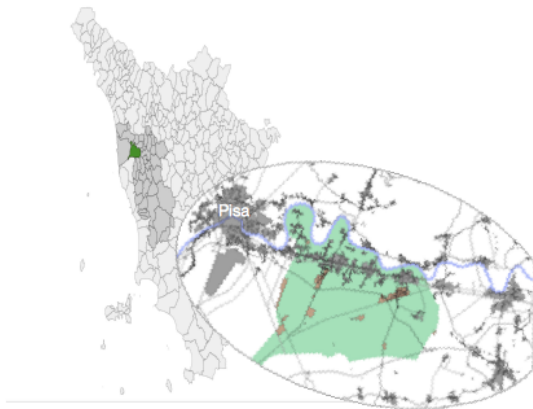
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Knock to his door!



Alessio Antonelli - Sindaco di Cascina, Pisa, Italy

Knock to his door!



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# Our Goal

- i. **Develop a model able to assess the societal implications of the actions of the SEAP.**
- ii. Provide a tool for the policymakers which may be use in identifying the most effective choices.
- iii. Monitor the effects of policies over time and identify inefficiencies and weaknesses.
  - ▶ The participative method allows the policymakers to be part of the construction of the qualitative model and to increase their awareness in the instrument.
  - ▶ System dynamics allows for a modular approach to modeling, that permits the analyst to decompose a complex social or behavioral system into its constituent components and then integrate them into a holistic model that can be easily visualized and simulated.

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# Building the model: two participative meetings

## Round 1

How **SEAP** actions may influence the **quality of life** on the territory, by achieving the **CO<sub>2</sub>** emissions reduction target?

## Round 2

Evaluate the **model** obtained in the first round and identify the main questions that the **quantitative analysis** should answer.

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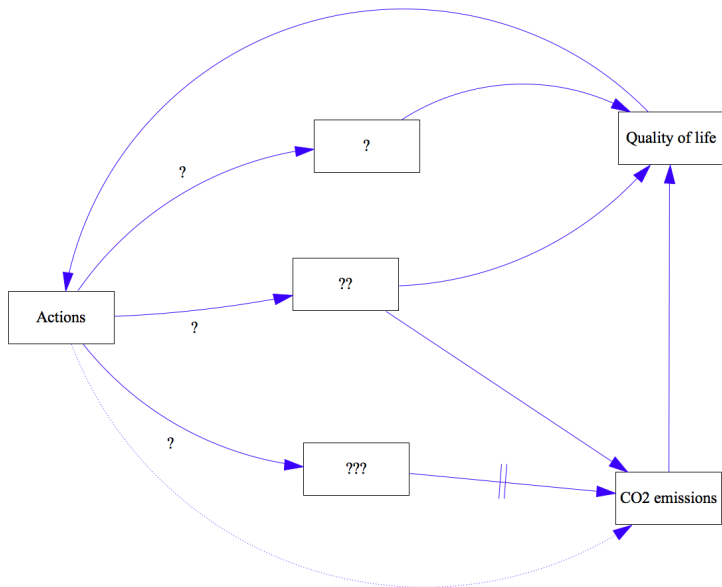
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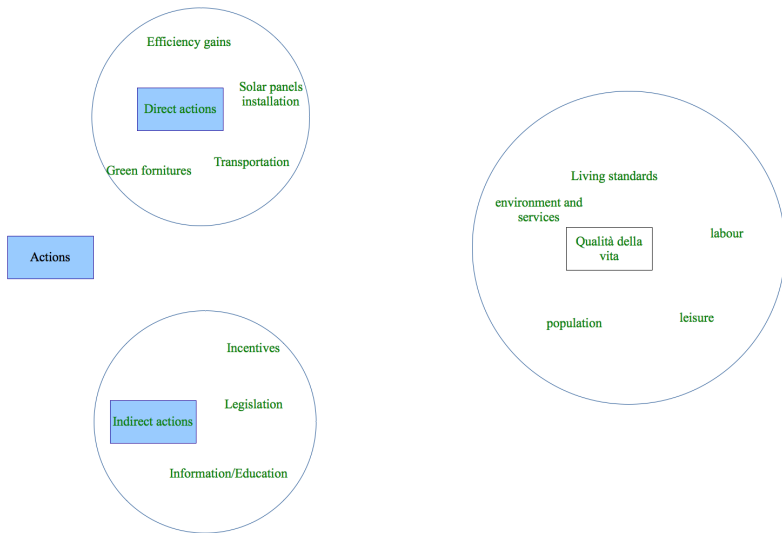
## Round 2

Evaluate the **model** obtained in the first round and identify the main questions that the **quantitative analysis** should answer.

# Which variables must be considered?



# Actions and indicators

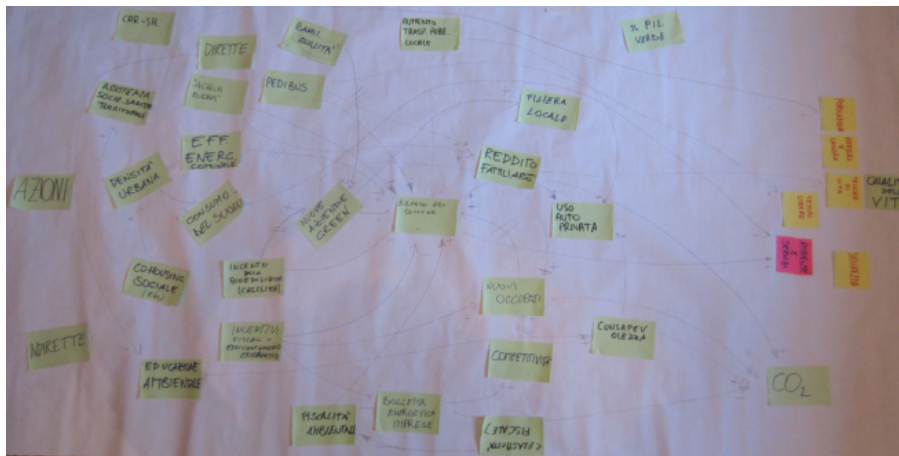


# Their faces

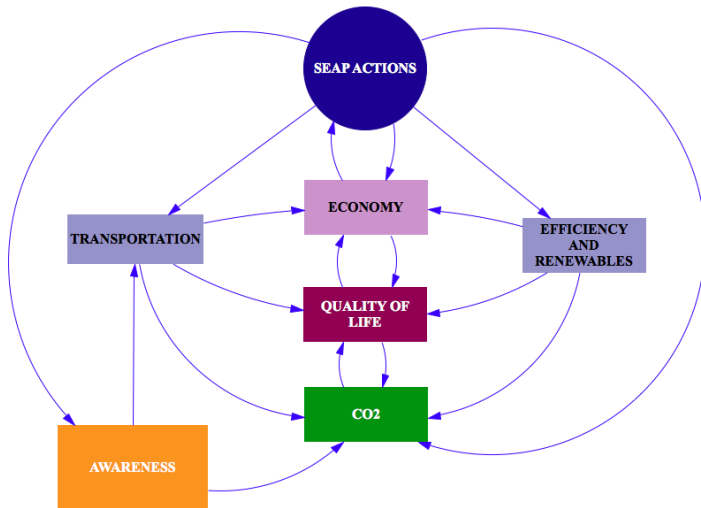




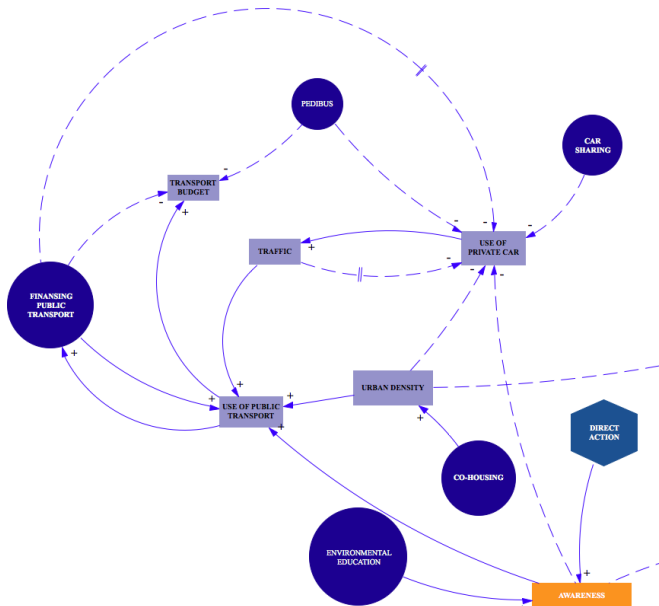
# The result: the chaos



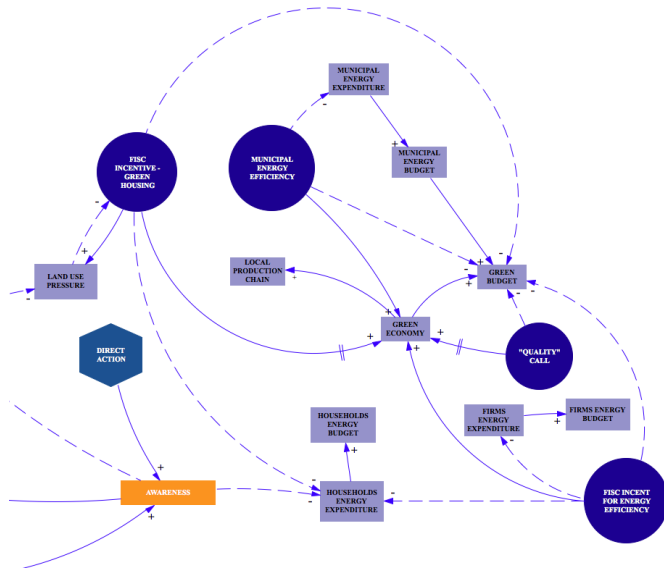
# Macro-structure of the model



# Transport

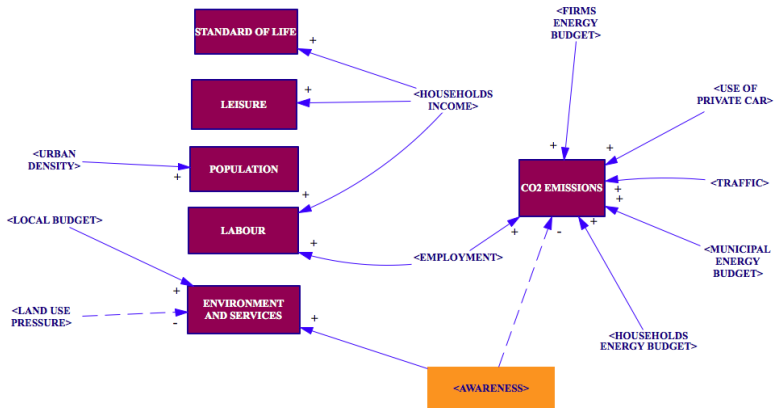


# Efficiency and Renewables





# Human wellbeing impacts





# The Baseline Emission Inventory

Six sectors, full of data.

Settore	Consumi energetici	Emissioni
Amministrazione comunale	8.228,96 MWh	3.014,27 tCO <sub>2</sub>
Residenziale	211.595,37 MWh	55.768,91 tCO <sub>2</sub>
Industria	59.654,26 MWh	16.092,25 tCO <sub>2</sub>
Terziario	44.041,49 MWh	20.634,71 tCO <sub>2</sub>
Agricoltura	3.331,92 MWh	1.034,55 tCO <sub>2</sub>
Trasporti	298.941,86 MWh	77.646,61 tCO <sub>2</sub>
<b>TOTALE</b>	<b>625.793,86 MWh</b>	<b>174.191,30 tCO<sub>2</sub></b>



# The SEAP

20 actions for 20%  $CO_2$  emissions reduction.

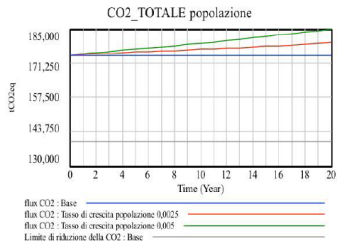
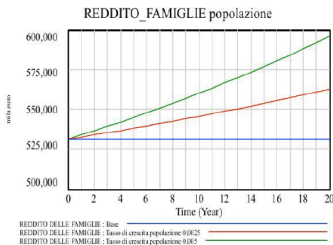
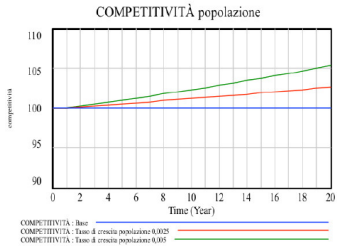
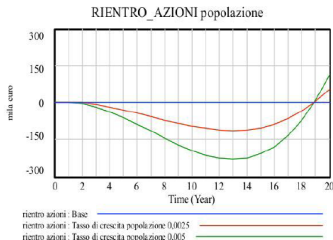
**TABELLA SINTETICA AZIONI PAES:**

AZIONE	Riduz. tCO <sub>2</sub>	Riduz. %CO <sub>2</sub>	Referente comunale (Uffici tecnici)	Tempi di realizzazione	Costi (stime)
AZIONE N.1 Programma di riqualificazione energetica edifici comunali	287,00	0,165	Elena Pugi	2014 - 2020	Convenzione: 400.500euro/anno Interventi fuori convenzione: circa 150.000 euro/anno
AZIONE N. 2 Riqualificazione energetica "ex Centro Accoglienza"	18,70	0,011	Elena Pugi	2015 - 2016	600.000 euro (FV escluso)
AZIONE N. 3 Riqualificazione energetica "Scuola Galilei"	35,50	0,020	Elena Pugi	2015 - 2016	770.000 euro
AZIONE N. 4 FV edilizia comunale	107,50	0,062	Elena Pugi	2014 - 2020	430.000 euro (FV Centro Accoglienza incluso)
AZIONE N. 5 Solare Termico Impianti Sportivi	24,30	0,014	Elena Pugi	2015 - 2020	50.000 euro
AZIONE N. 6 Scuola Panda "Progetto Sun"	14,50	0,010	Elena Pugi	2015	216.000 euro
AZIONE N. 7 Piscina Comunale - Impianto a biomasse	240,00	0,138	Sabina Testi	2016- 2018	400.000 euro
AZIONE N. 8 Efficienza energetica dell'illuminazione Pubblica	1.082,70	0,622	Elena Pugi	2014 - 2020	non quantificabile
AZIONE N. 9 Sostituzione dei mezzi comunali	44,50	0,026	Luisa Nigro	2015 - 2020	circa 700.000 euro

# Preliminary Scenarios: business as usual

## Ipotesi:

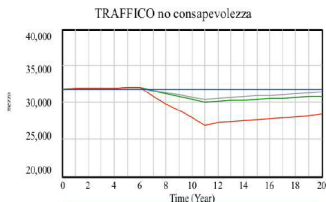
- Tasso di crescita della popolazione pari a 0,0025 annuo
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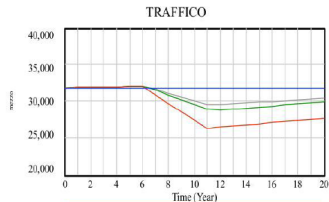
# Preliminary Scenarios: transportation

Ipotesi: Investimento di 100 mila euro annui di durata quinquennale

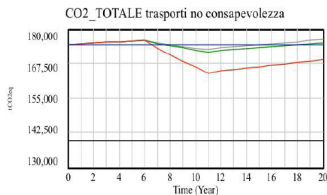
- sull'azione di **Aumento trasporto pubblico**;
- sull'azione di **Car-sharing**;
- diviso al 50% tra le due azioni;



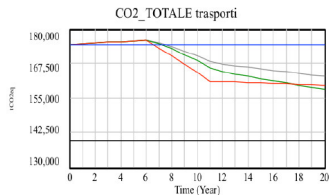
Traffic: Base  
Traffic: aumento trasporto pubblico 100 line 6-10 no cons  
Traffic: car sharing 100 line 6-10 no cons  
Traffic: trasporto pubblico e car sharing 50 line 6-10 no cons



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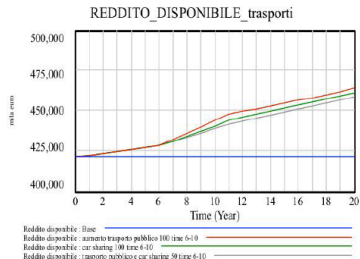
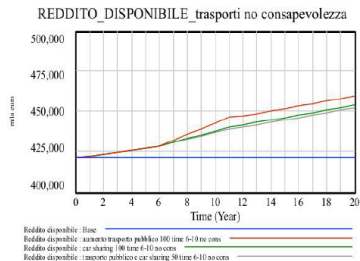
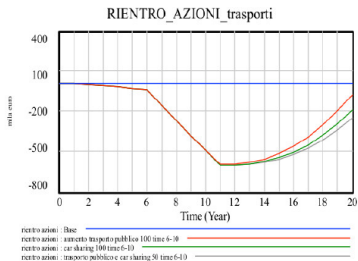
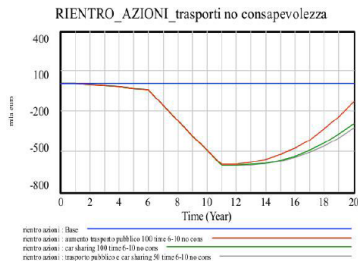


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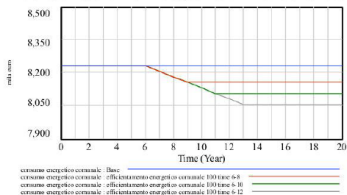


# Preliminary Scenarios: municipal energetic efficiency

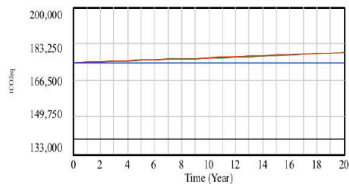
Ipotesi: investimento di 100 mila euro annui sull'azione di **Efficiamento energetico comunale**

- durata triennale;
- durata quinquennale;
- durata settennale.

CONSUMO\_ENERGETICO\_COMUNALE efficienza

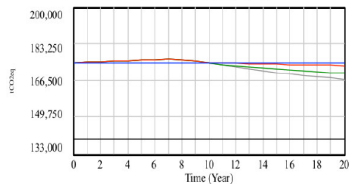


CO2 TOTALE efficienza no consapevolezza



flux CO2: Base  
flux CO2: efficienza energetica comunale 100 time 6-8 no cons  
flux CO2: efficienza energetica comunale 100 time 6-10 no cons  
flux CO2: efficienza energetica comunale 100 time 6-12 no cons  
Limite di riduzione della CO2: Base

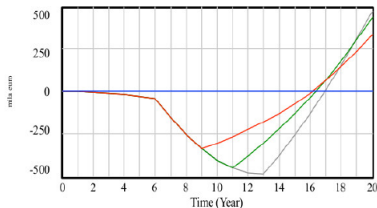
CO2 TOTALE efficienza



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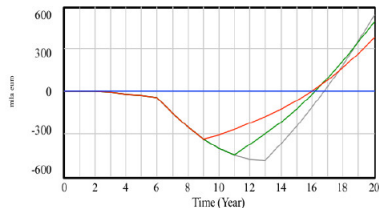
# Preliminary Scenarios: municipal energetic efficiency

## RIENTRO AZIONI efficientamento no consapevolezza



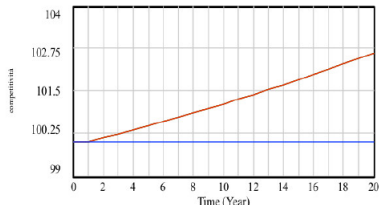
rientro azioni : Base  
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 rientro azioni : efficientamento energetico comunale 100 tmc 6-10 no cons  
 rientro azioni : efficientamento energetico comunale 100 tmc 6-12 no cons

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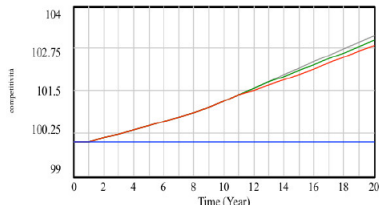
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## COMPETITIVITÀ efficientamento no consapevolezza



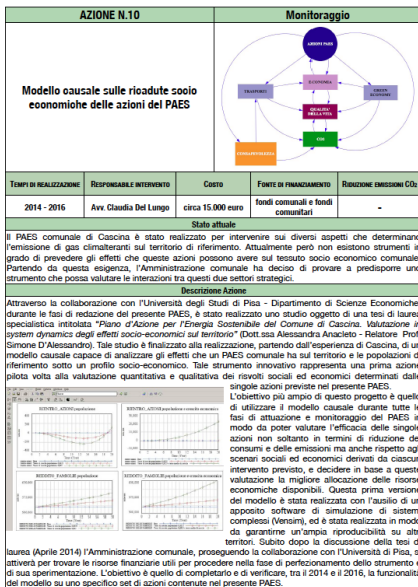
COMPETITIVITÀ : Base  
 COMPETITIVITÀ : efficientamento energetico comunale 100 tmc 6-8 no cons  
 COMPETITIVITÀ : efficientamento energetico comunale 100 tmc 6-10 no cons  
 COMPETITIVITÀ : efficientamento energetico comunale 100 tmc 6-12 no cons

## COMPETITIVITÀ efficientamento



COMPETITIVITÀ : Base  
 COMPETITIVITÀ : efficientamento energetico comunale 100 tmc 6-8  
 COMPETITIVITÀ : efficientamento energetico comunale 100 tmc 6-10  
 COMPETITIVITÀ : efficientamento energetico comunale 100 tmc 6-12

# Concluding Remarks



# Is this project a degrowth initiative?

- ▶ The local administration is not involved in the degrowth movement.
- ▶ However, the reduction of GHG emissions and the improvement in the quality of life are our common goals.
- ▶ The investigation of the societal impacts of strategies towards a low carbon society can clarify how degrowth initiatives can improve the wellbeing on a territory.
- ▶ Citizens understand the trade-offs very well, and they can support the change.
- ▶ Social movements should be sufficiently strong and influential to change policymakers' strategy.



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