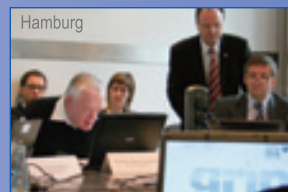
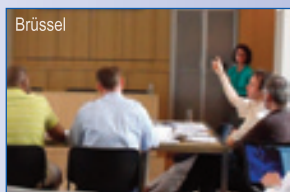
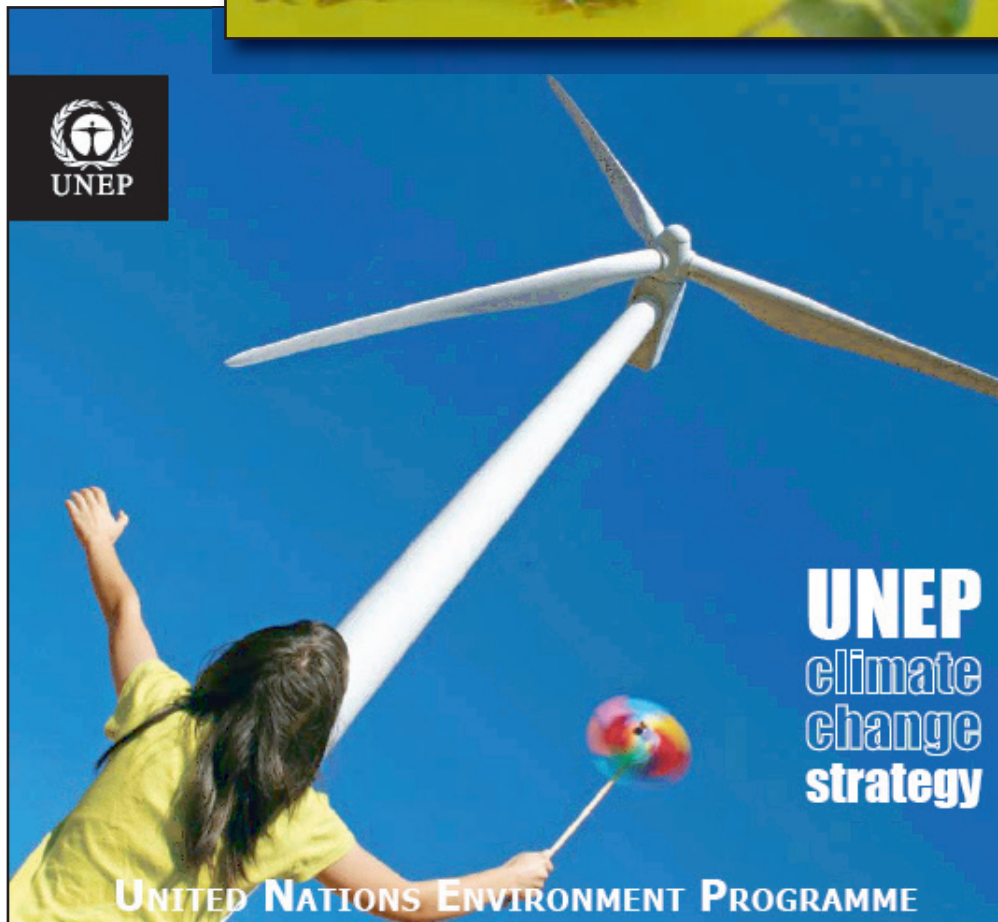
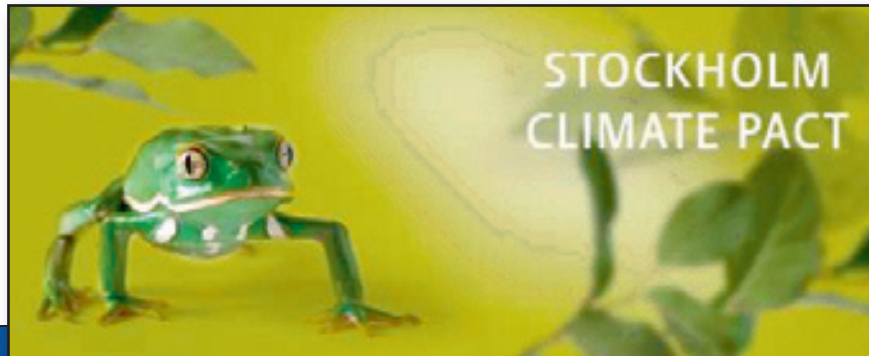


# EU CO<sub>2</sub><sup>o</sup>80/50

350 European stakeholders develop  
consensual roadmaps for mitigation





**Everywhere in the world, cities, regions and nations are developing mitigation strategies.**

**There is a big danger to take for reality what you write down on a paper.**

**The best programs and goals do not use anything, if the decision makers in the large cities and regions do not join in from the very beginning.**

Worldwide, metropolitan regions are responsible  
for 75% of the CO<sub>2</sub> emissions.  
Mitigation is an urban task.  
EUCO2 80/50 incorporates regional stakeholders  
into the strategy finding process.





**Initiative born within METREX\***

**Partners:  
14 Metropolitan regions**

**Coordination:  
Hamburg Metropolitan Region**

**Industrial partner:  
General Electric**

**Project methodology recommended  
by the Covenant of Mayors**

**Academic partner:  
University of Manchester**

\*METREX = Organisation of European Metropolitan Areas

**From a mere technical point of view, CO<sub>2</sub> reduction by 80% until 2050 is possible.**

**The main problem consists in transferring knowledge into tangible politics.**


**Everywhere in Europe you meet stakeholders showing a mentality like god Janus.**



In the interest of future generations we have to make effective laws to combat climate change!


But not too strong laws since this might provoke protest and I want to be reelected!





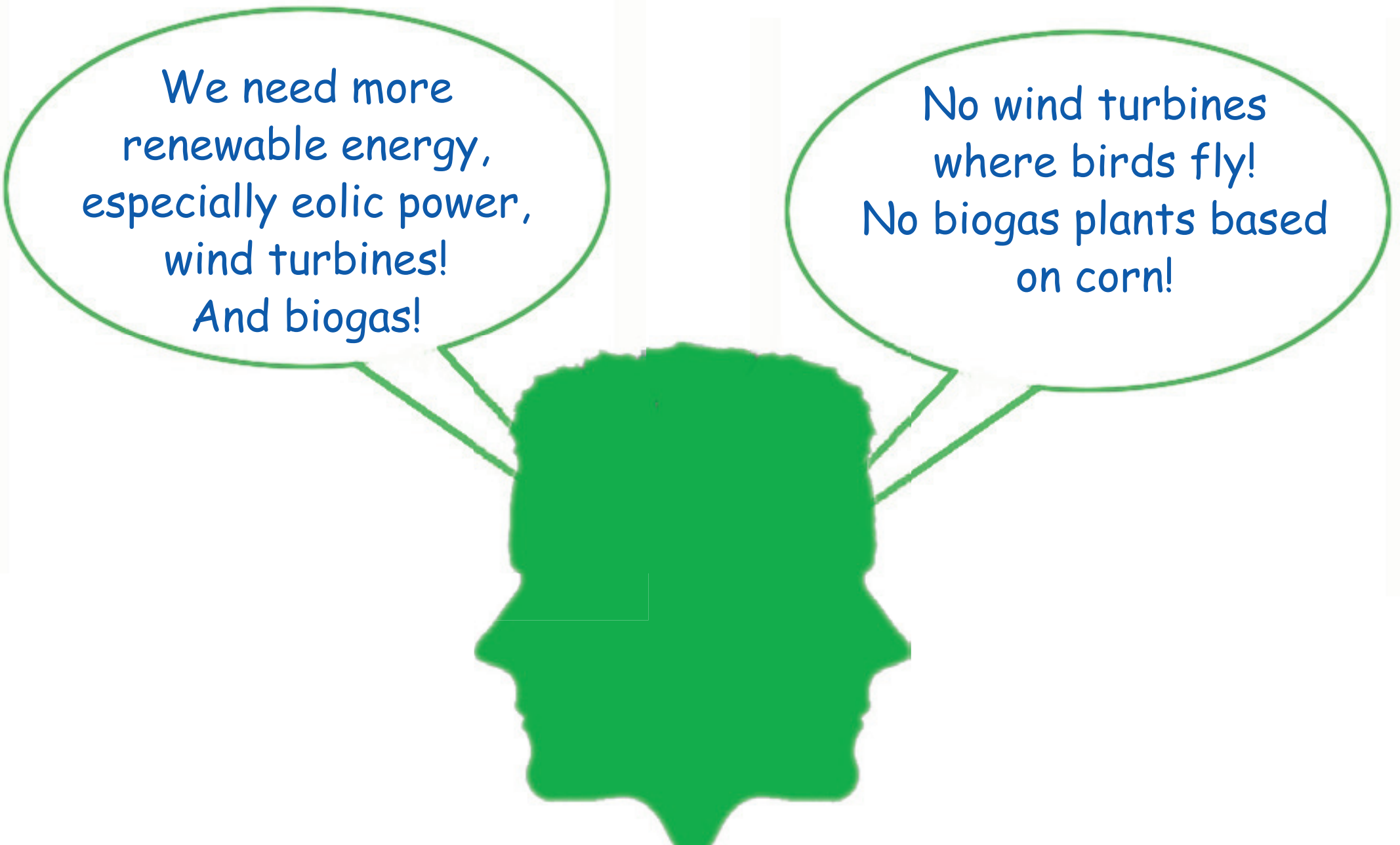
We will invest in efficiency - this is our obligation. And it increases our competitiveness!

We cannot invest too much since this could endanger our competitiveness!



We are fighting  
against climate change in  
the interest of future  
generations...

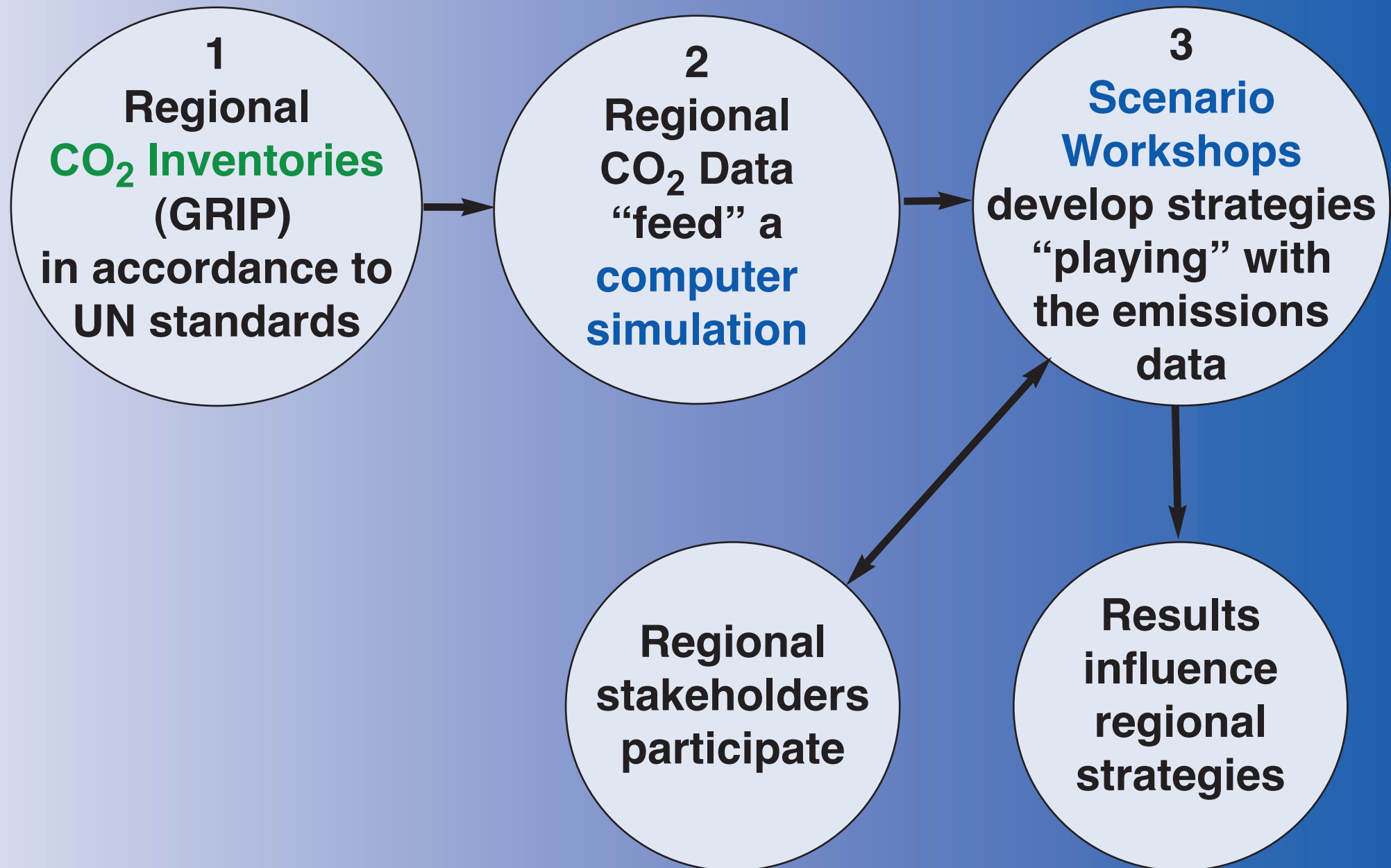
If climate  
protection laws endanger  
our jobs, we will do  
everything to combat  
them...

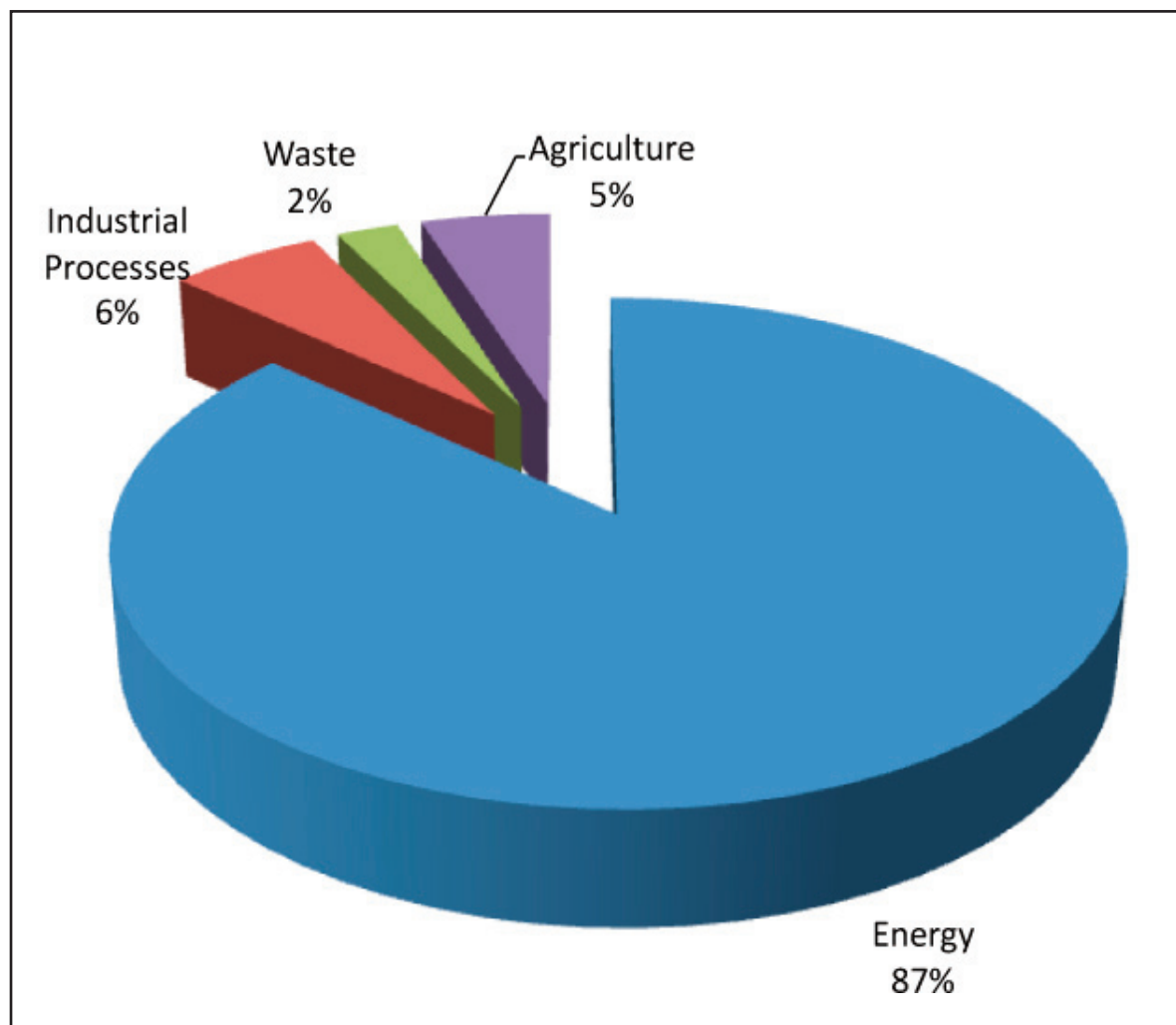


We need more  
renewable energy,  
especially eolic power,  
wind turbines!  
And biogas!

No wind turbines  
where birds fly!  
No biogas plants based  
on corn!







**Average distribution of the emission sectors in the 14 partner regions (CO<sub>2</sub>e)**

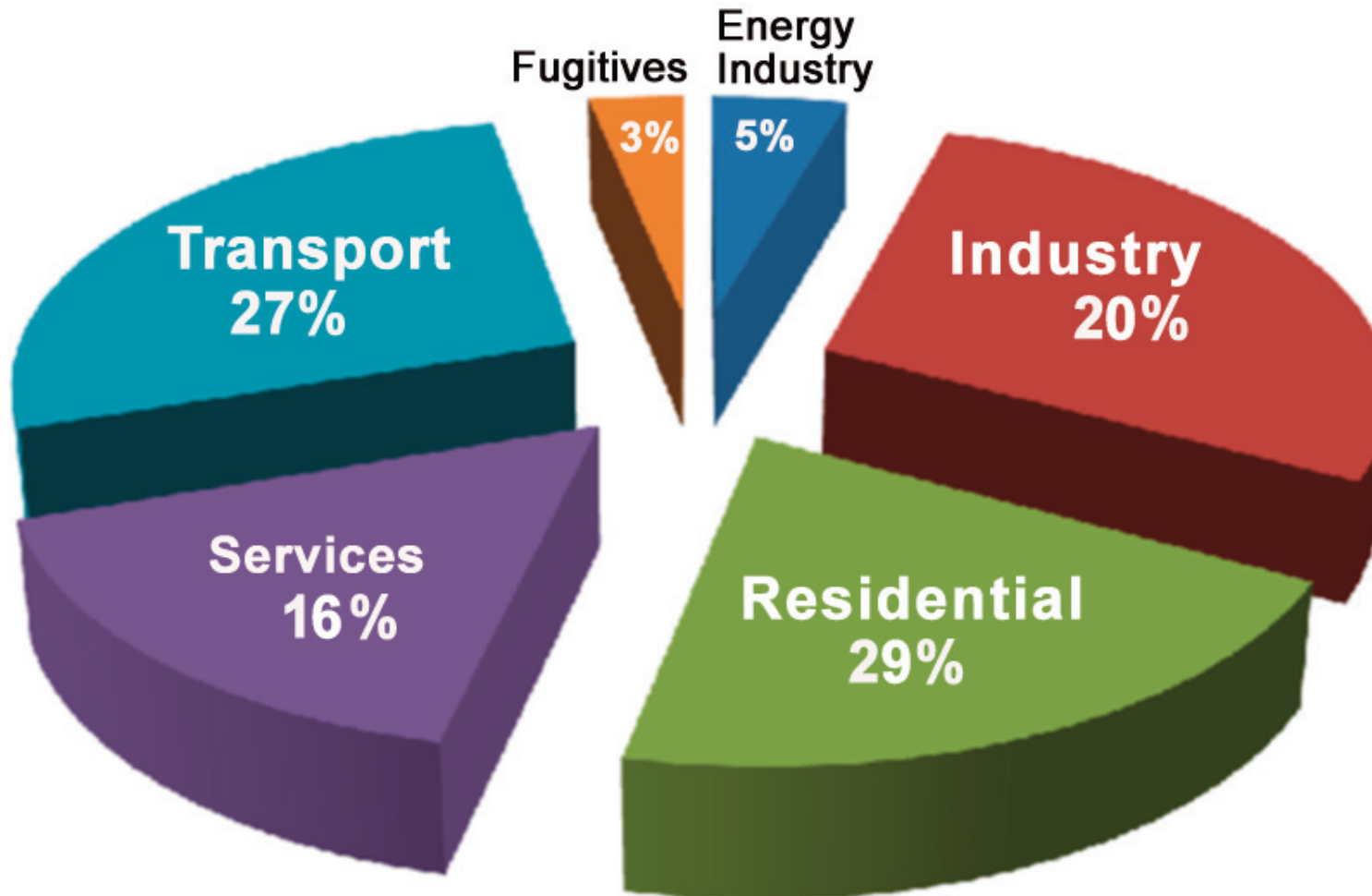
### Emission sectors

- **Agriculture**
- **Industrial processes**
- **Waste**
- **Energy**

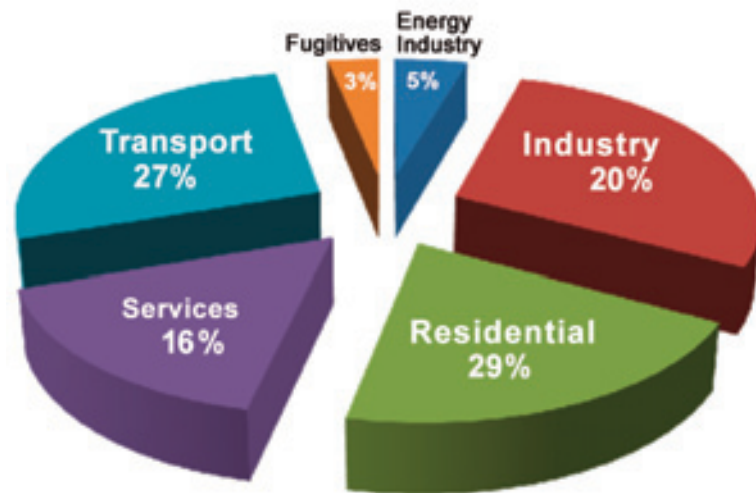
**Result 14 regions:**

**87% of emissions  
in the energy sector**

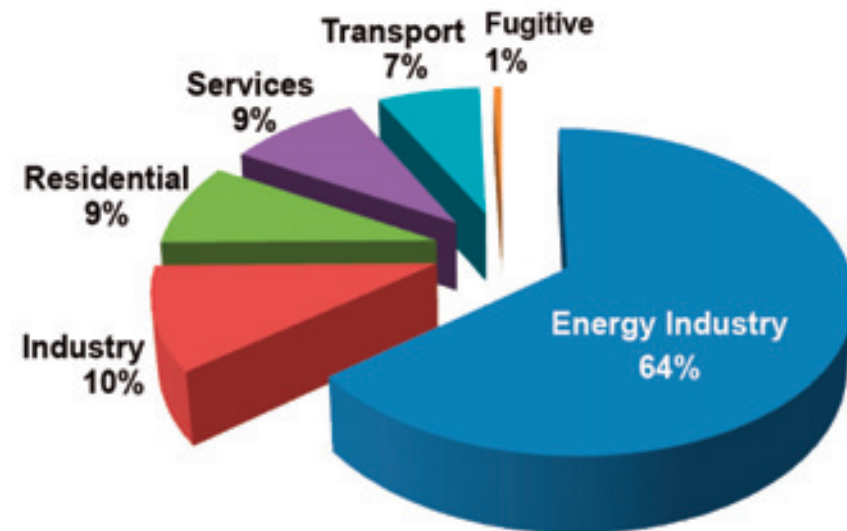
**GRIP concentrates  
on energy**



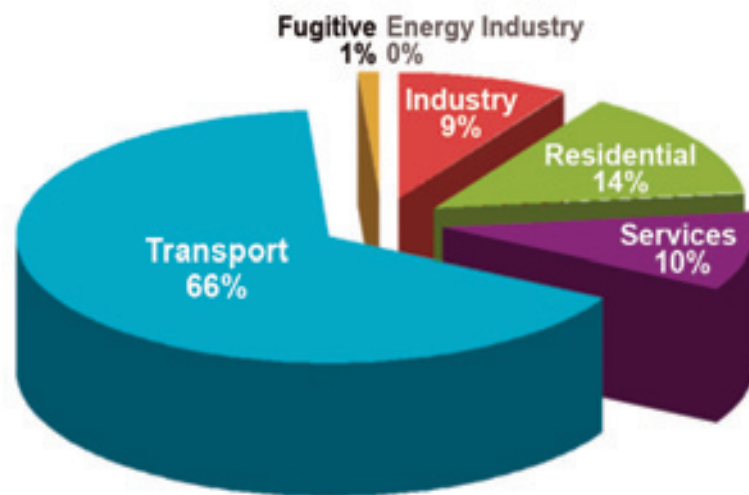
**Average emissions in the energy subsectors in the  
14 partner regions (CO<sub>2</sub>e)  
(GRIP Inventories 2009)**



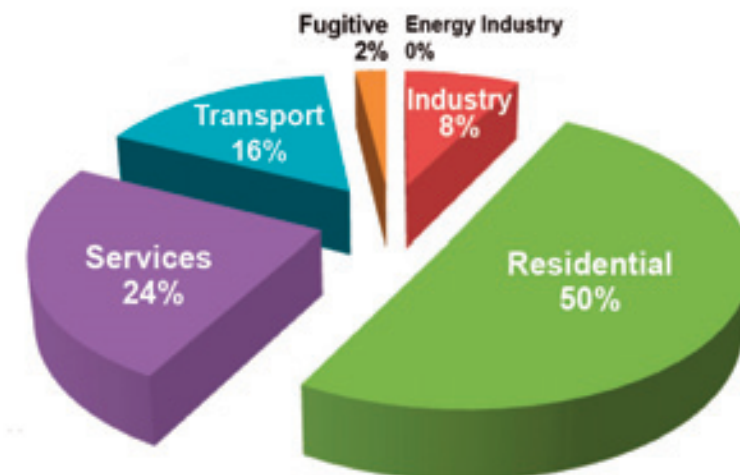
Average of all 14 EUCO2 partners



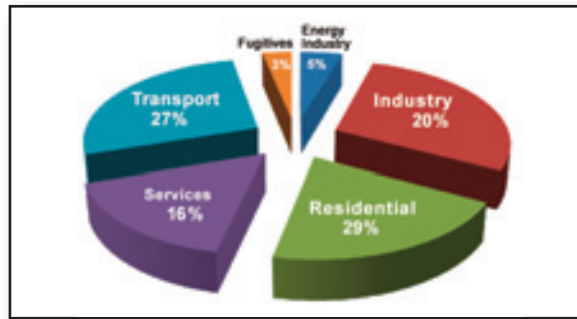
Rotterdam



Oslo



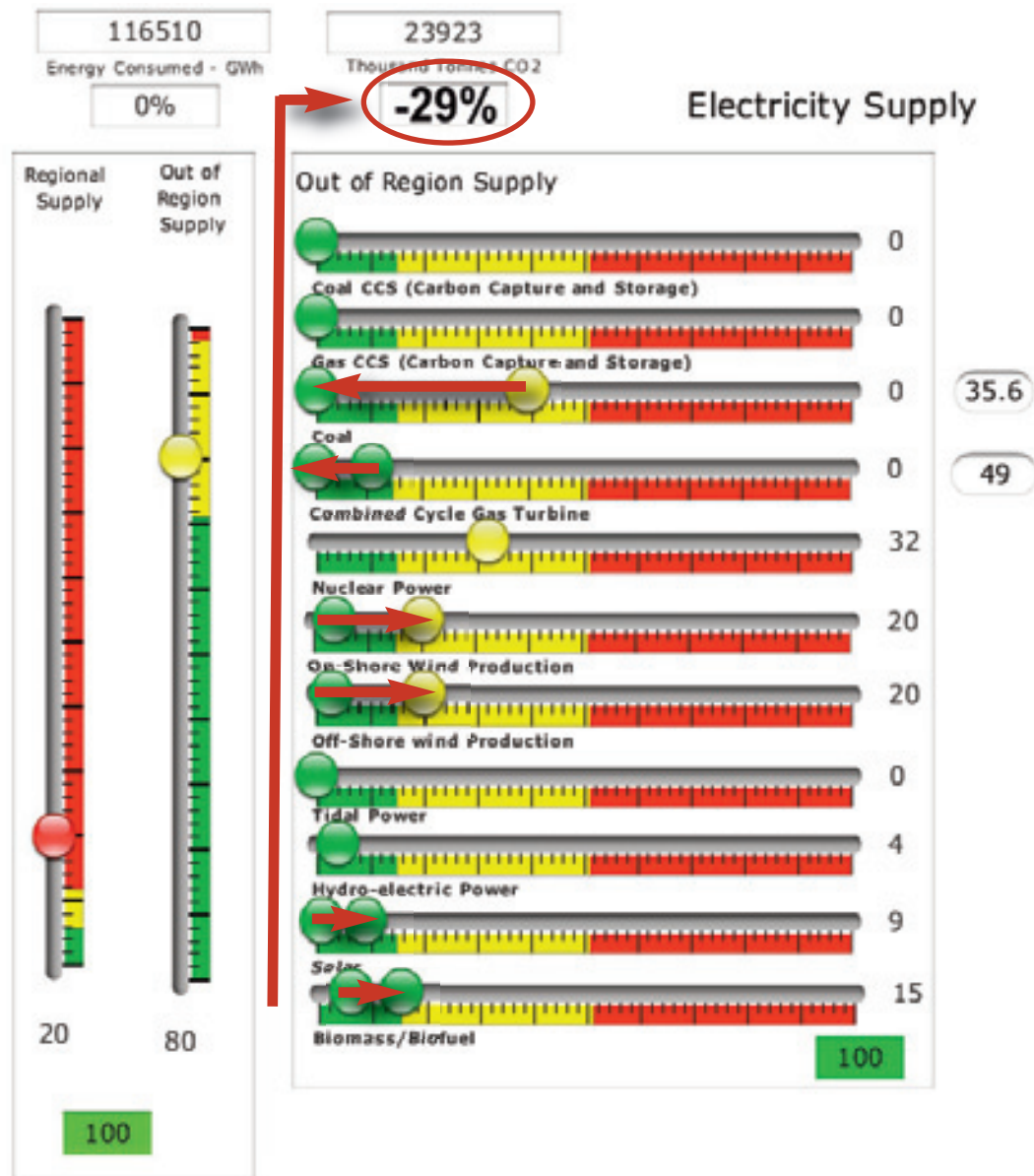
Brussels



Energy consumption data  
+ energy supply data  
+ economic & demographic data



For the scenario workshops, the regional CO<sub>2</sub> data are transferred into the scenario program. Stakeholders from politics, economy, administration, science and NGOs “play” with the data and see instantly the effects of their assumptions.

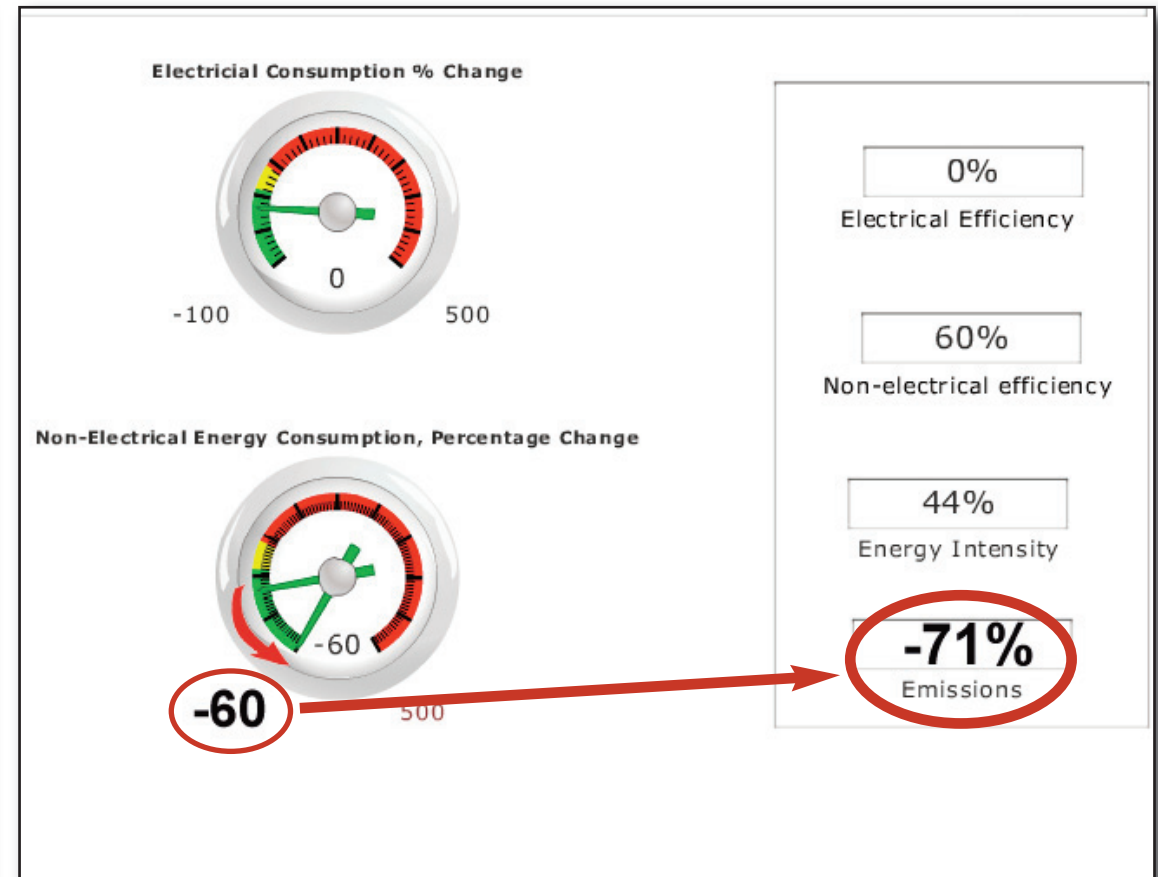
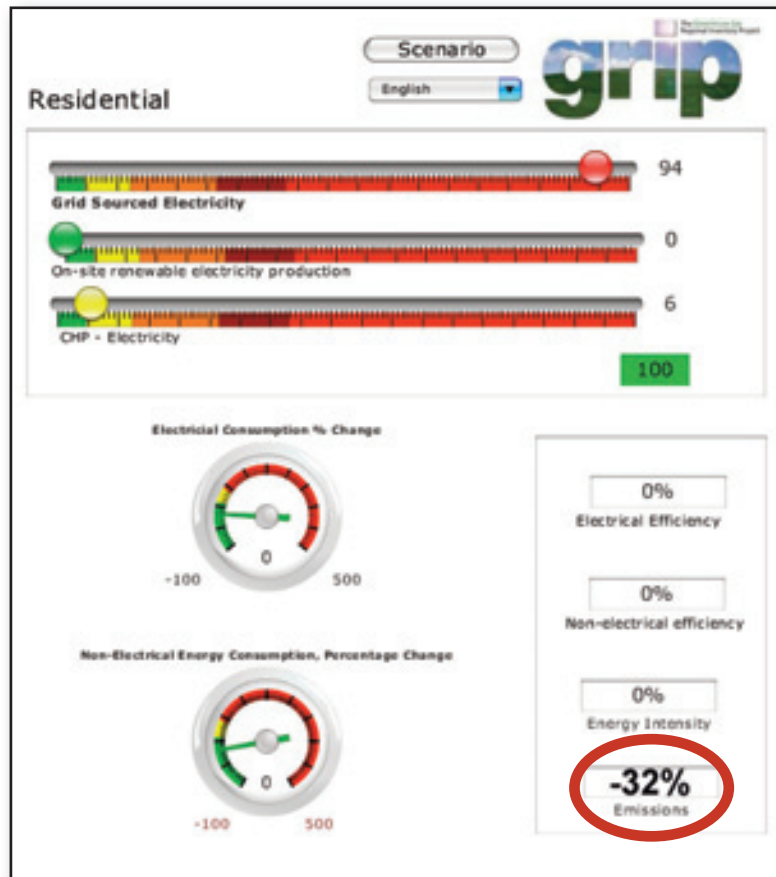


## Assumption in Hamburg: A carbon free grid in 2050

In the scenario tool, the stakeholders can insert their assumptions.

If you substitute coal and gas by renewables, the overall regional emissions decrease by 29%.

This value is different in the partner regions depending on the current share of renewables in the electrical grid.



An overall carbon free electrical grid would decrease the emissions from electrical energy consumption in the residential sector by 32% (in Hamburg). If you make the assumption that you can decrease the consumption of non-electrical energy by 60%, the CO<sub>2</sub> reduction in the residential sector sums up to -71%.



Effects of a carbon free grid:

-32%

Higher energy efficiency by insulation:

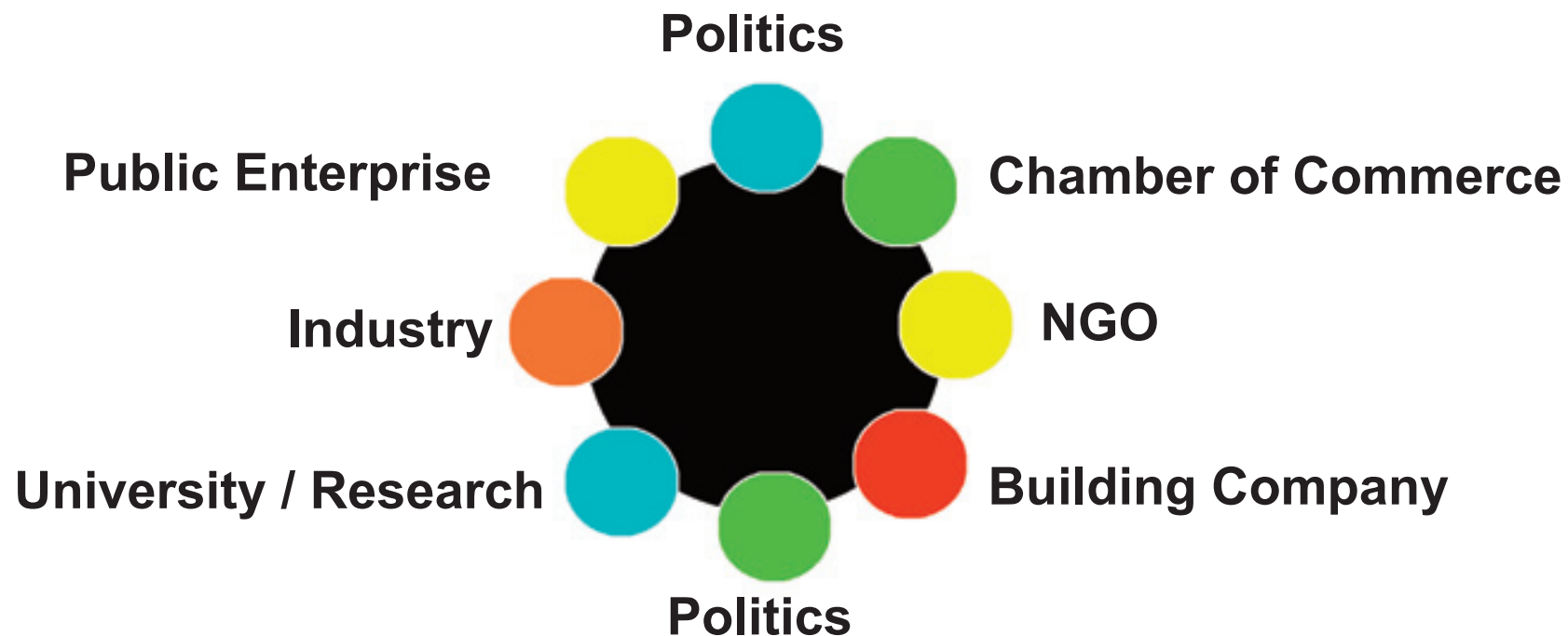
-39%

More renewables in the non-electrical energy mix

-9%

-80%

If you change the non-electrical energy mix (by solar thermal installation or wood heating), you find the resting 9% of CO<sub>2</sub> reduction to reach the 80% goal.



**In the 14 partner regions, 50 scenario workshops took place with the participation of 350 regional stakeholders.**

**The stakeholders included ministers, state secretaries, representatives of the Chambers of Commerce, CEOs from the industrial, housing and service sectors, senior academics, heads of public administration and scientists.**



**Never before, so many regional European stakeholders have worked together in order to anticipate and plan the European energy future in a consensual process.**



Hamburg, Scenario Day 2



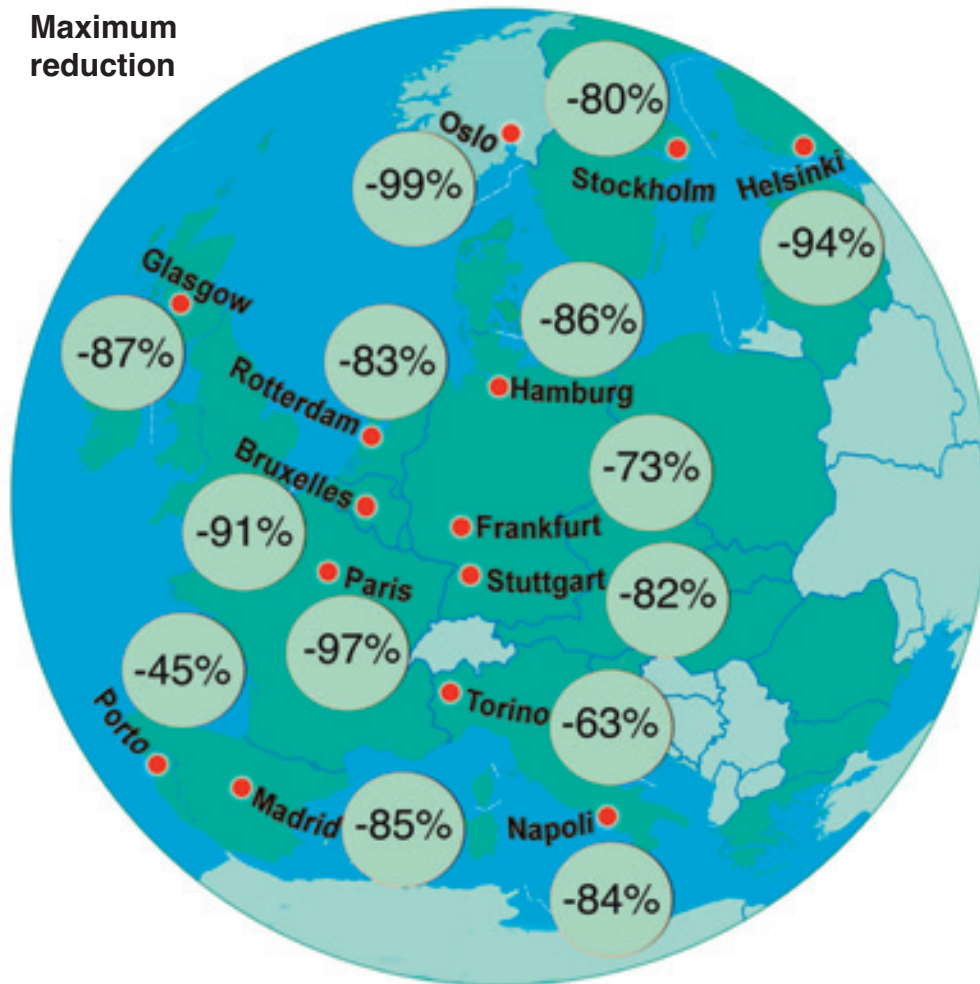
Naples, Scenario Day 3

**The results are not a forecast. They tell us:**

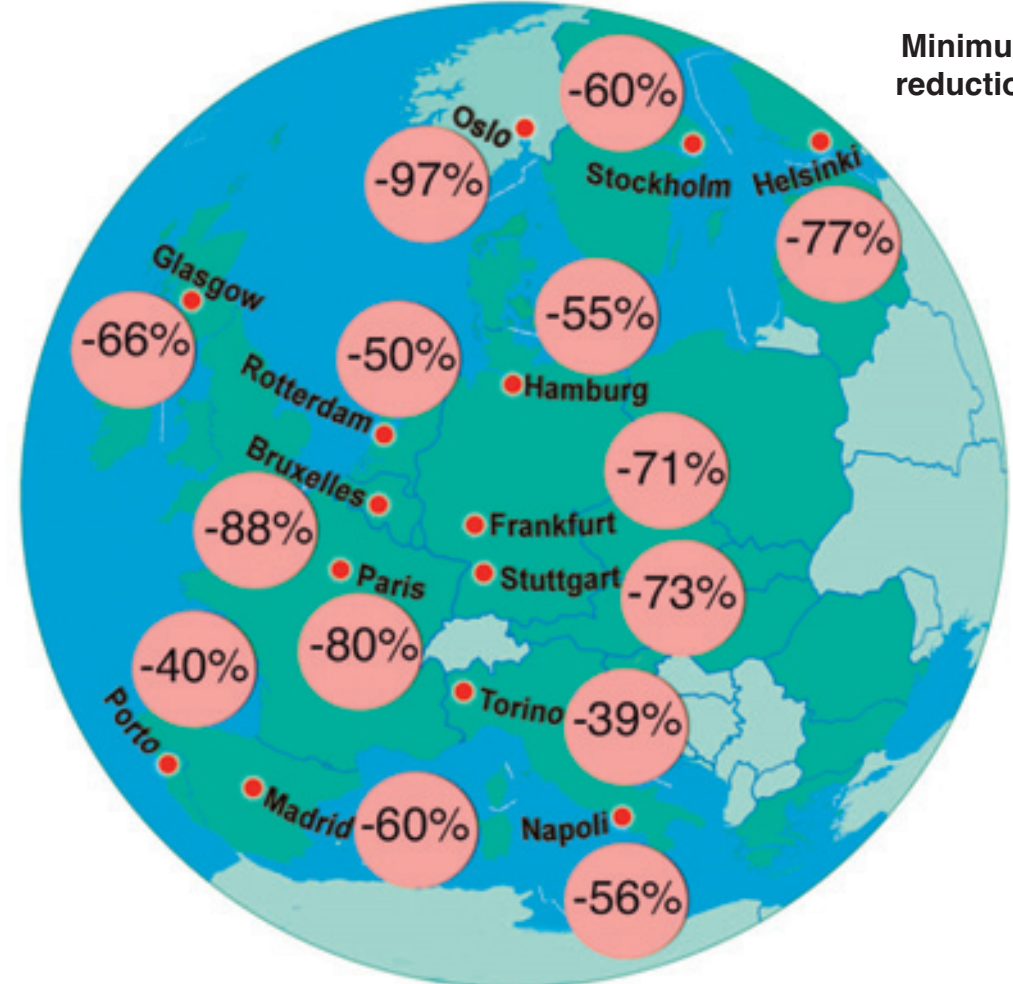
- **how 350 regional stakeholders see the energy future**
- **which mitigation measures they believe to be realistic**
- **what are the most promising measures.**

**The results help us to plan our steps for mitigation.**

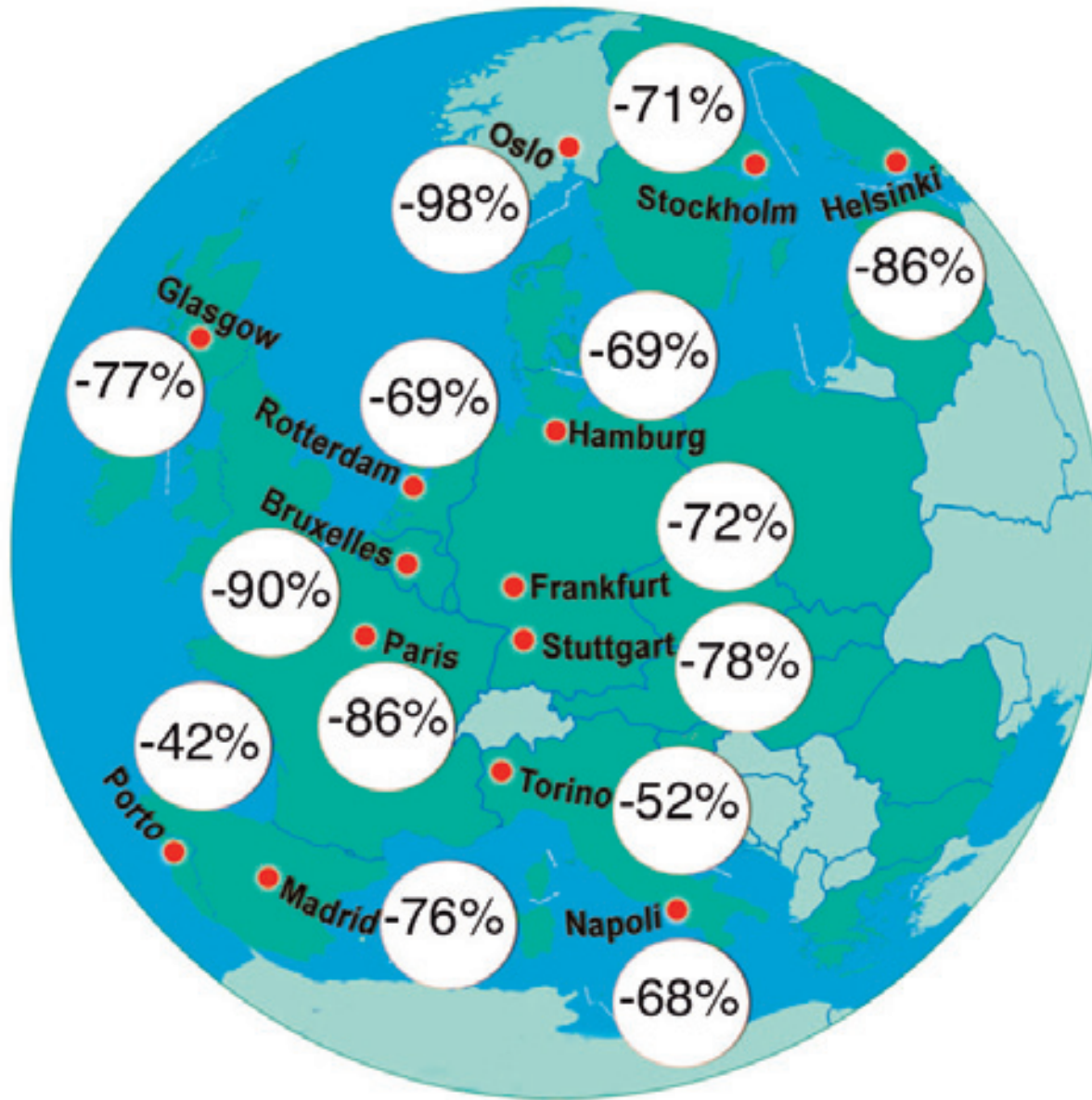
Maximum  
reduction



Minimum  
reduction



The CO<sub>2</sub> reductions of the scenario sessions varied slightly between the participating metropolitan regions with lower reduction levels in southern Europe.



Average CO<sub>2</sub> reduction in the partner regions

**The majority of the partner regions failed to achieve the 80% goal.**

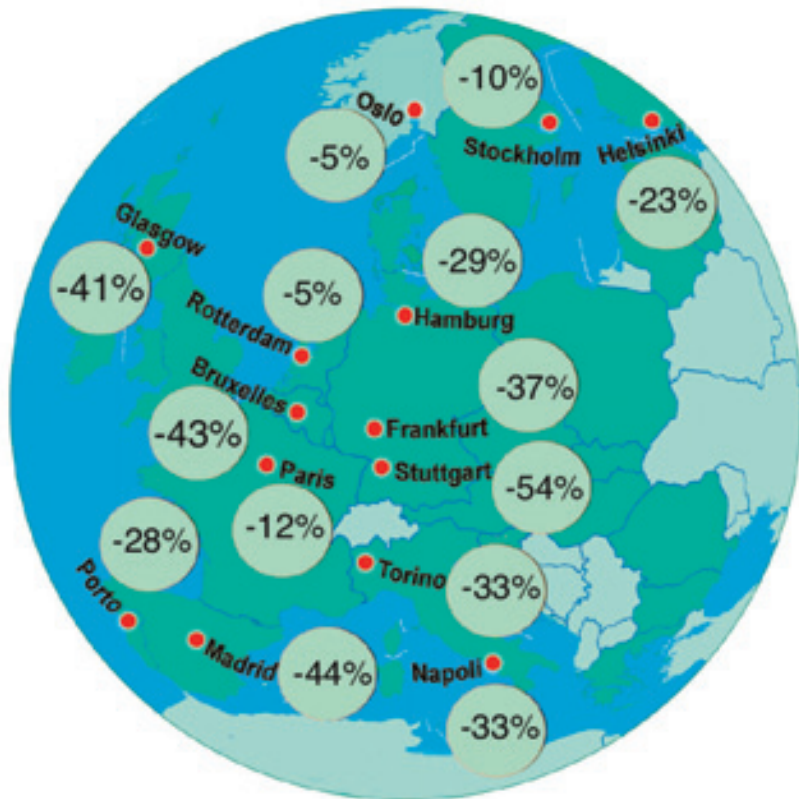
**Only 35% of the scenarios achieved this goal.**

**This shows a lack of information among regional stakeholders.**

## Renewable grid



≈ -25%\*



**A 100% decarbonised European grid decreases the overall CO<sub>2</sub> emissions by “only” 25%.**

**The regional effects vary a lot.**

Regional effects of a decarbonised grid

## Renewable grid



≈ -25%



Residential and service sector

-15 %



Industry

-10 %



Transport

0 %

The reduction achieved by a fully renewable grid is reflected in the different energy consuming sectors in proportion to the current share of electrical consumption in the overall energy consumption of the sector.

The effects would be different in the different regions.

### Reduction potential in the residential and services sectors



**The residential and the services sectors can reduce their consumption of non-electrical energy by efficiency increases in their buildings sectors, contributing thus 25% to the overall CO<sub>2</sub> reduction.**

**(Emission reductions by electricity savings in these sectors are reflected, in proportion to their consumption of electrical energy, in the overall 25% CO<sub>2</sub> emissions reduction of the carbon-free power grid postulated on page 14.)**

## Higher efficiency in Industry



The representatives of the industrial sector in the scenario workshops assumed that at least 50% of the industrial CO<sub>2</sub> emissions can be avoided by increasing energy efficiency.

An additional assumption was that many refineries would close down because of a future reduced use of fossil fuels.

### Switch to electromobility and hydrogen



**The switch to electromobility and hydrogen will decrease the overall CO<sub>2</sub> emissions by 20%.**

**Two conditions:**

- 1. Electrical energy has to be saved in other energy consuming sectors in order to answer the new demand in the transport sector.**
- 2. Electric cars must weigh less than cars that use fossile fuels.**

## Common key findings of EUCO2 80/50

### Effects of a renewable grid



≈ -25%

### Savings in the residential and services sector (non-electrical energy)



≈ -25%

15%

-40%

### Higher efficiency in industry (without electricity)



≈ -10%

10%

-20%

### Switch to electromobility and hydrogen



≈ -20%

0%

-20%

---

-80%

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