

Energy, Systems, Modelling ~~Improving~~ *Evidence Base* for Ireland's Low Carbon *Roadmap*

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Trans-disciplinary conversations on transitions to sustainability

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Coláiste na hOllscoile Corcaigh, Éire
University College Cork, Ireland



Energy Policy &
Modelling Group

Focus

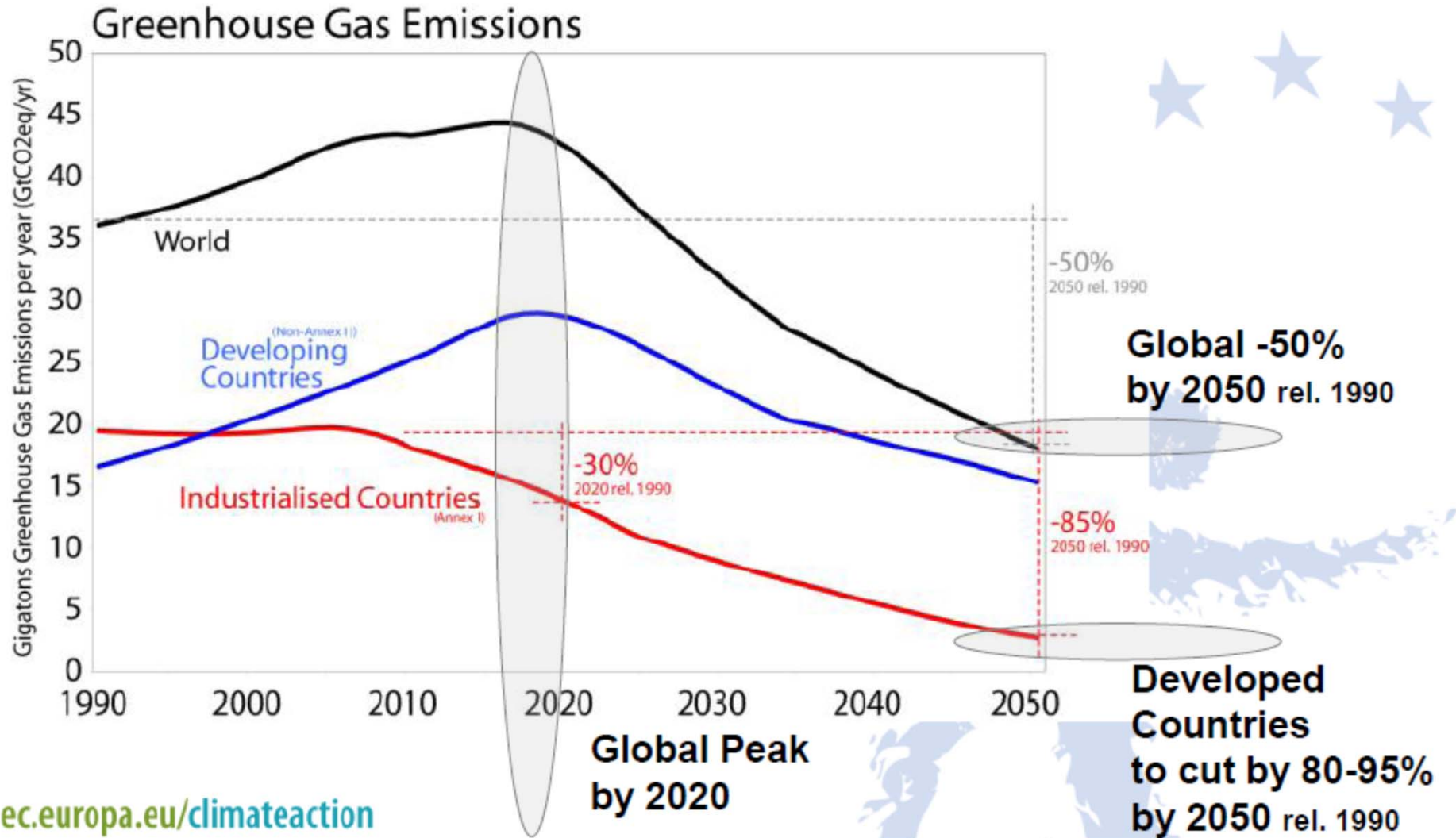
- Ireland's Low Carbon Roadmap 2050
- Transitions to transitions (interdisciplinary largely within the dominant linear construct)
- What if scenario analysis using energy systems modelling
- Connecting silos (science, engineering, economics and agriculture) to explore consequences
 1. how low should we go? (beef and dairy?)
 2. what are the consequences for our energy system?
 3. what does it cost?
 4. food versus fuel?

How low should we go?

Radiative forcing (2005=2.36 W/m ² Kyoto Gases)	CO₂ Equivalent Concentration (2005=435 ppm _e Kyoto gases)
2° C 2.6 W/m ²	450 ppm _e
3° C 3.7 W/m ²	550 ppm _e
4° C 4.5 W/m ²	650 ppm _e

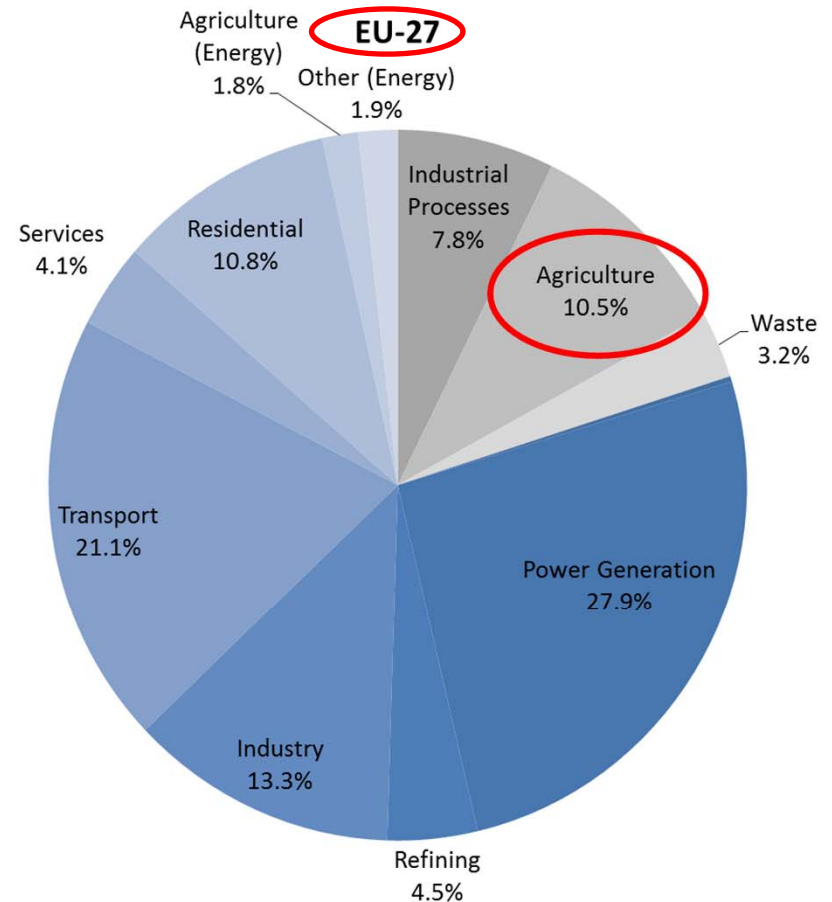
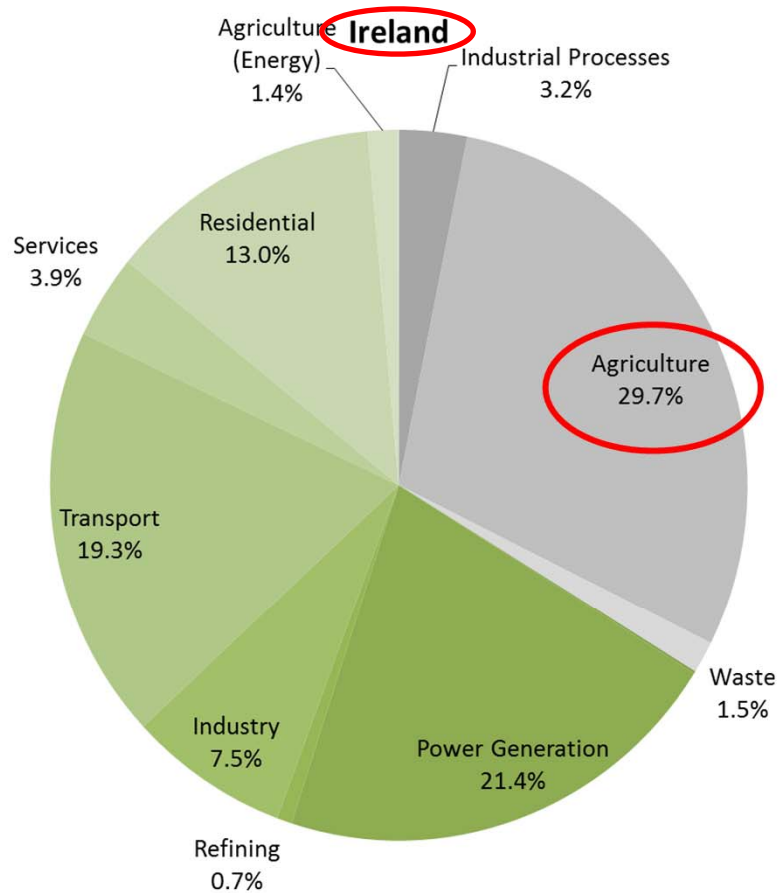
Cancun Agreements in 2010 that established a global commitment to a maximum temperature rise of 2 degrees Celsius above pre-Industrial levels

Who does what?



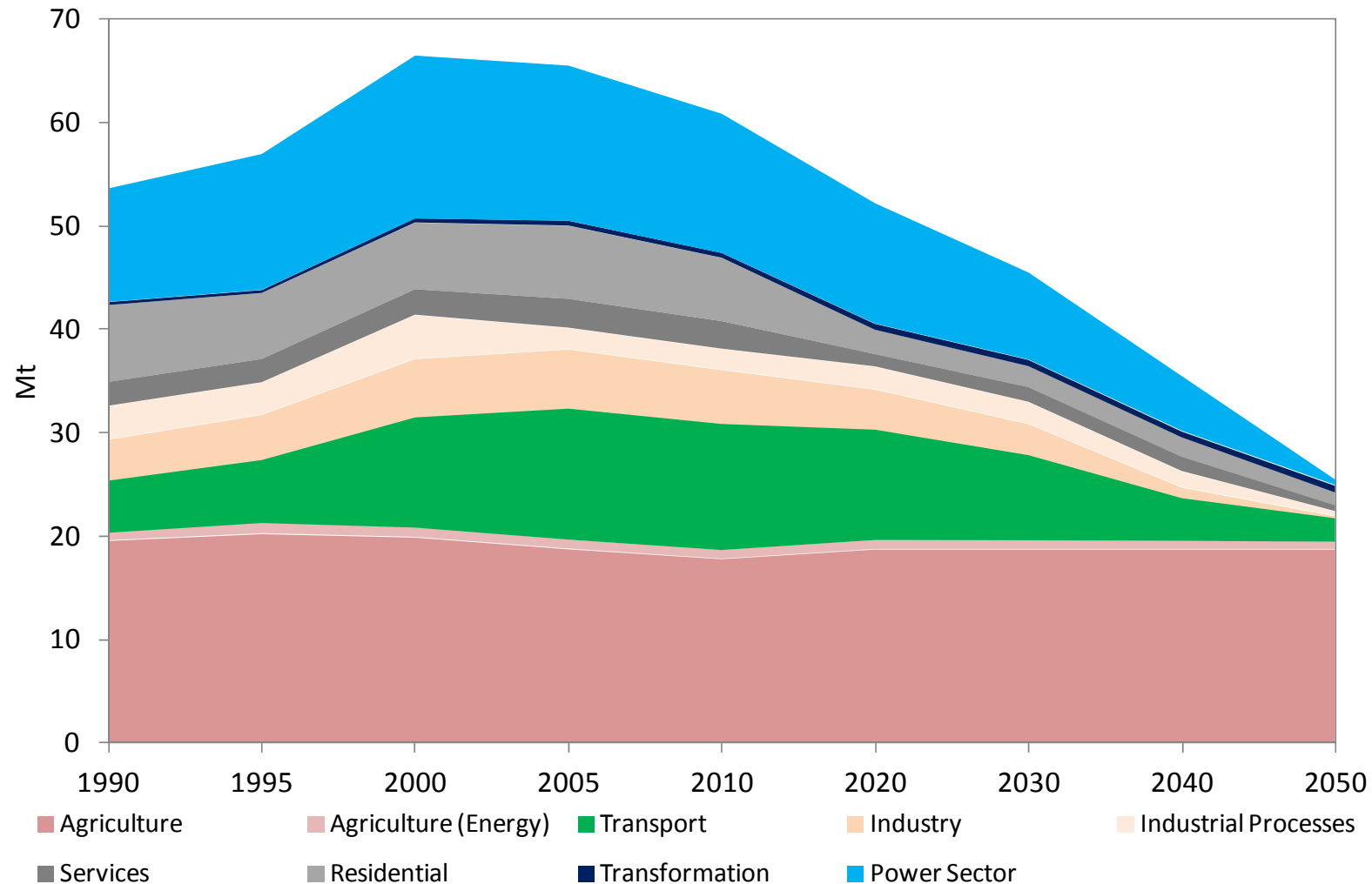
European Council committed to 80% - 95% reduction in GHG emissions below 1990 levels by 2050.

What about Ireland?



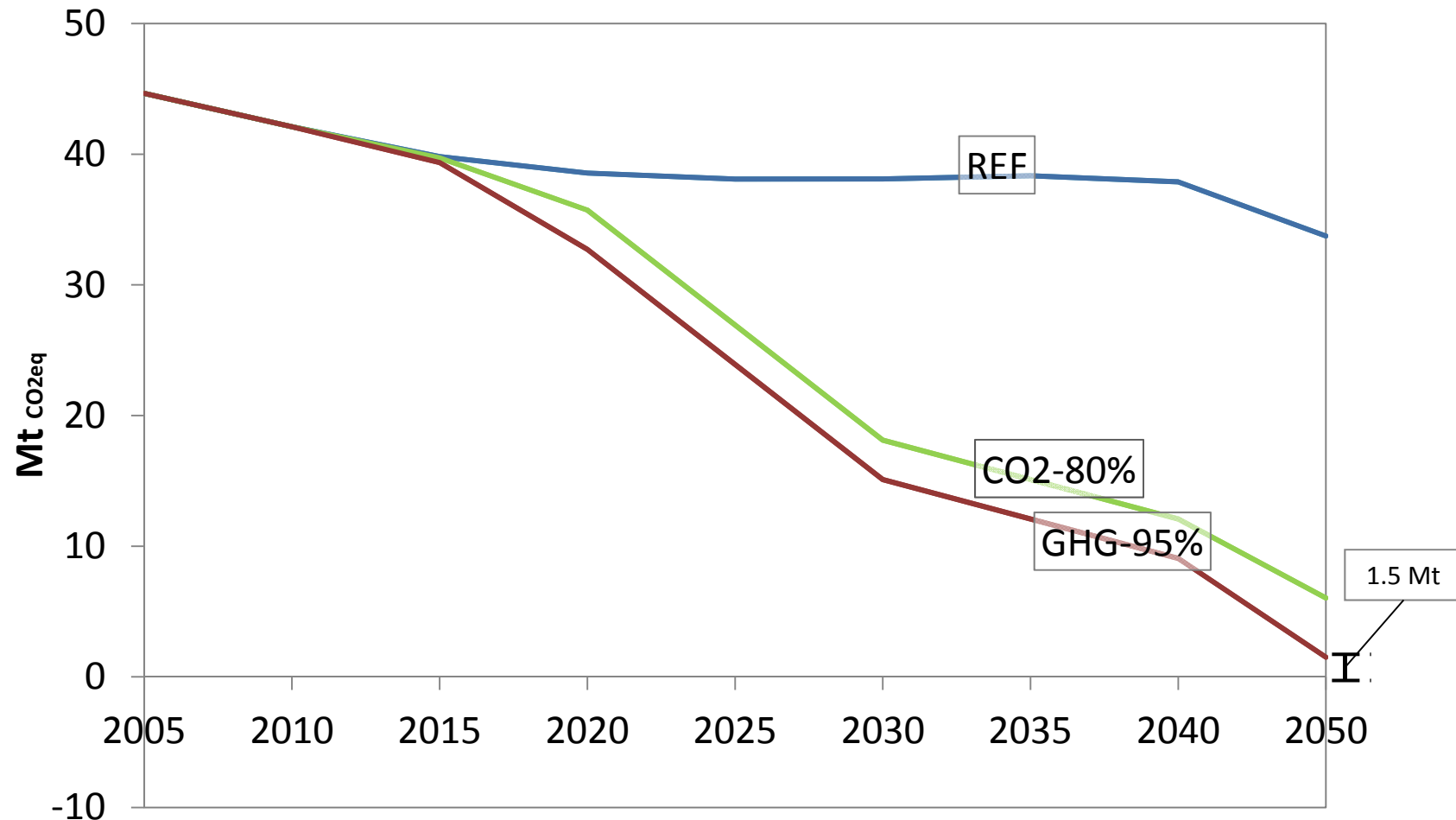
Agri-food sector contributes approx 7% to Ireland's economy
represents Ireland's largest indigenous industry.
the largest contribution to GHG emissions is from the beef and dairy
over 80% of beef and dairy is exported

What about Ireland?



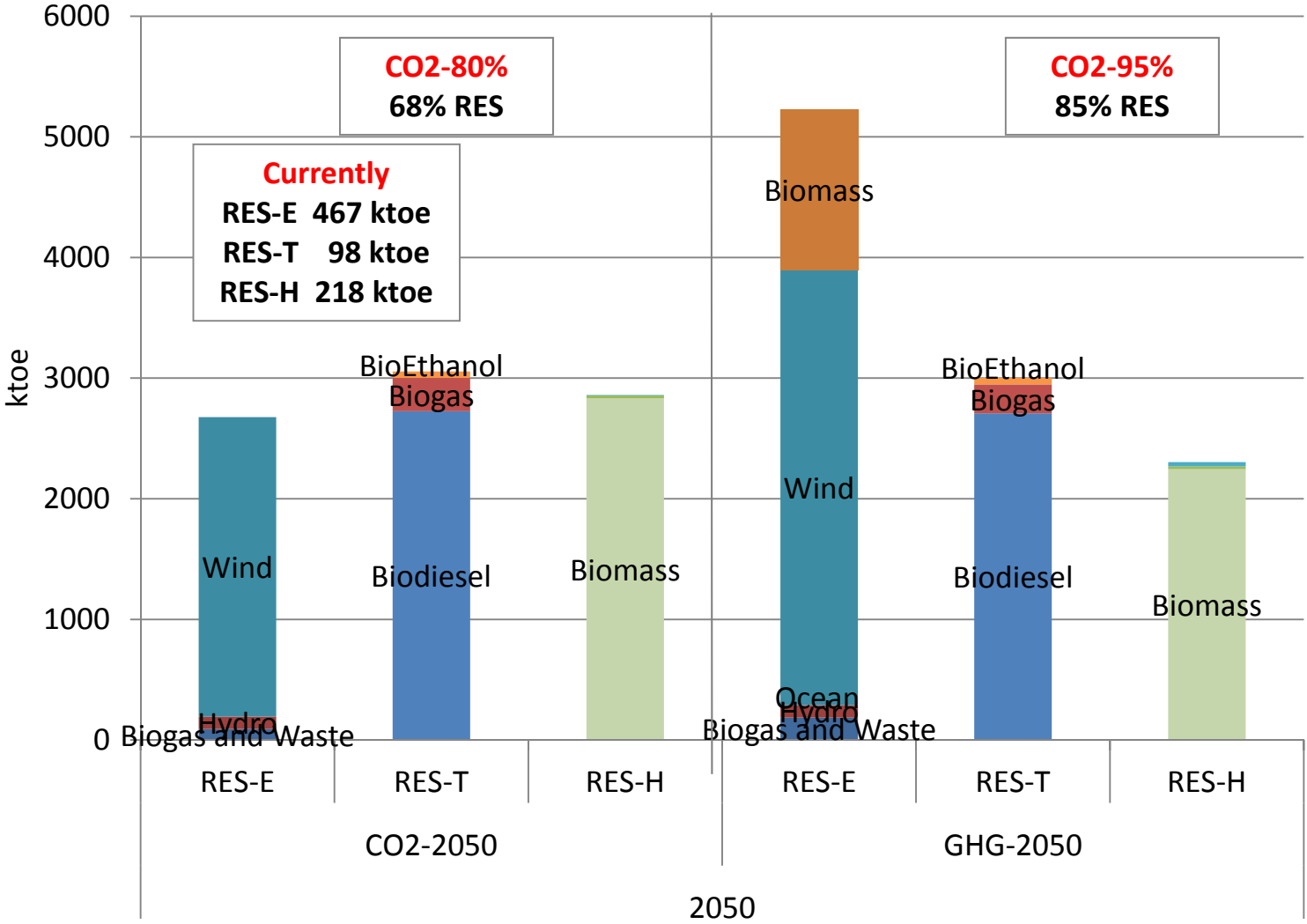
Beef and dairy farming has few options for emissions reduction.
Growth in beef and dairy farming is not aligned with developing a low carbon economy
BUT, our beef and dairy products have a relatively low level of carbon intensity

Implications for Energy



1.5 Mt = 50% of annual CO₂ emissions from Moneypoint Coal fired plant
= 16% of our electricity
= 3% of our current energy use

Scenario Results: 2050 Renewable Energy



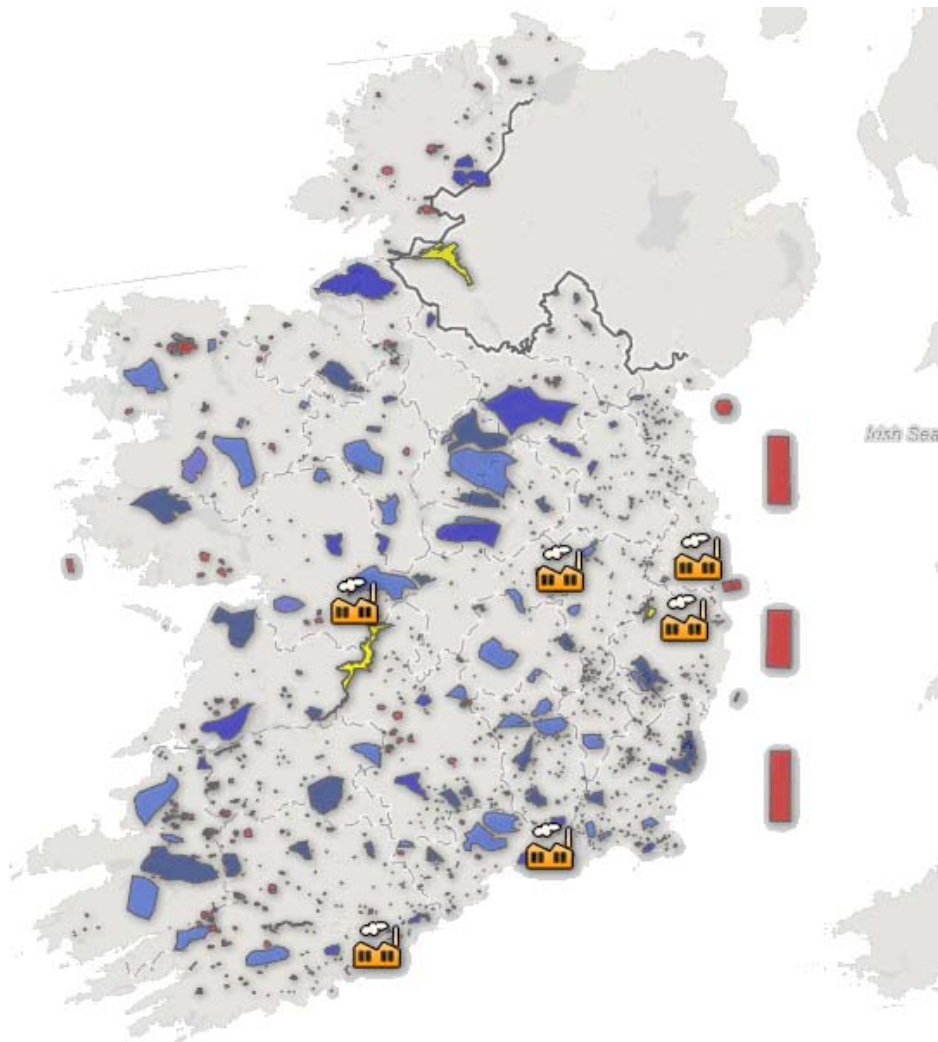
Currently we get 6% of our energy from renewable resources
 If we don't address consumption, we need to go to 70% - 90% renewable energy
 We do get up to a doubling of electricity BUT not full electrification

How much will we pay? MACC (€/tCO₂)

Scenario	2020	2030	2040	2050
<i>CO2-80</i>	33	136	99	273
<i>CO2-85</i>	33	131	158	523
<i>CO2-90</i>	33	127	158	694
<i>CO2-95 = GHG-80</i>	65	185	173	1308

current level of carbon tax in Ireland is €20/tCO₂

Land-Use Food versus Fuel



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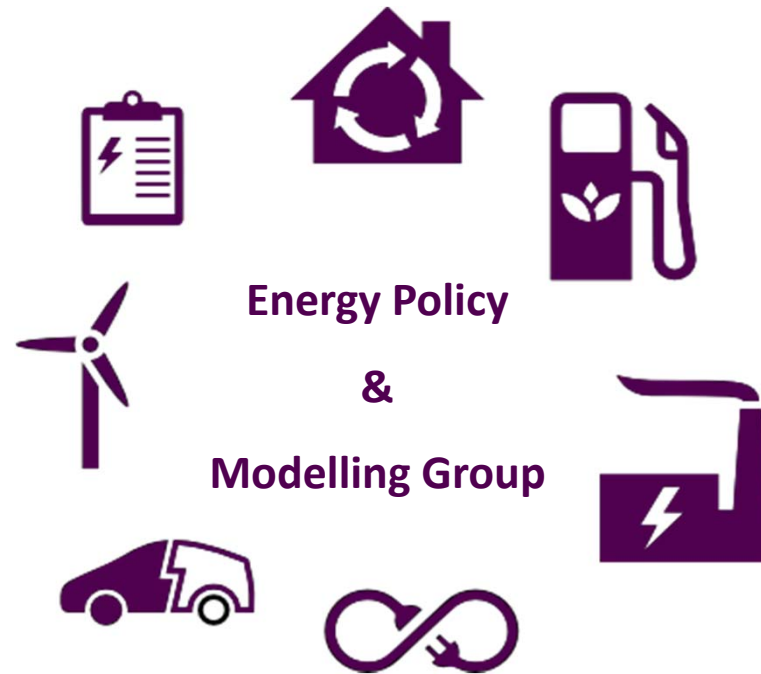
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Conclusions

- Energy systems modelling brings something different to economics
- Focus of energy policy is on electricity and within that on wind (50% elect from wind = 9% energy)
- Urgently need to focus on renewable heat and transport, in contrast to the dominant wind focus
- What if scenarios highlight implications of targets
- Land-use is largely neglected in the discussions
- Do we want to maintain beef and dairy?
- Does not address society or politics

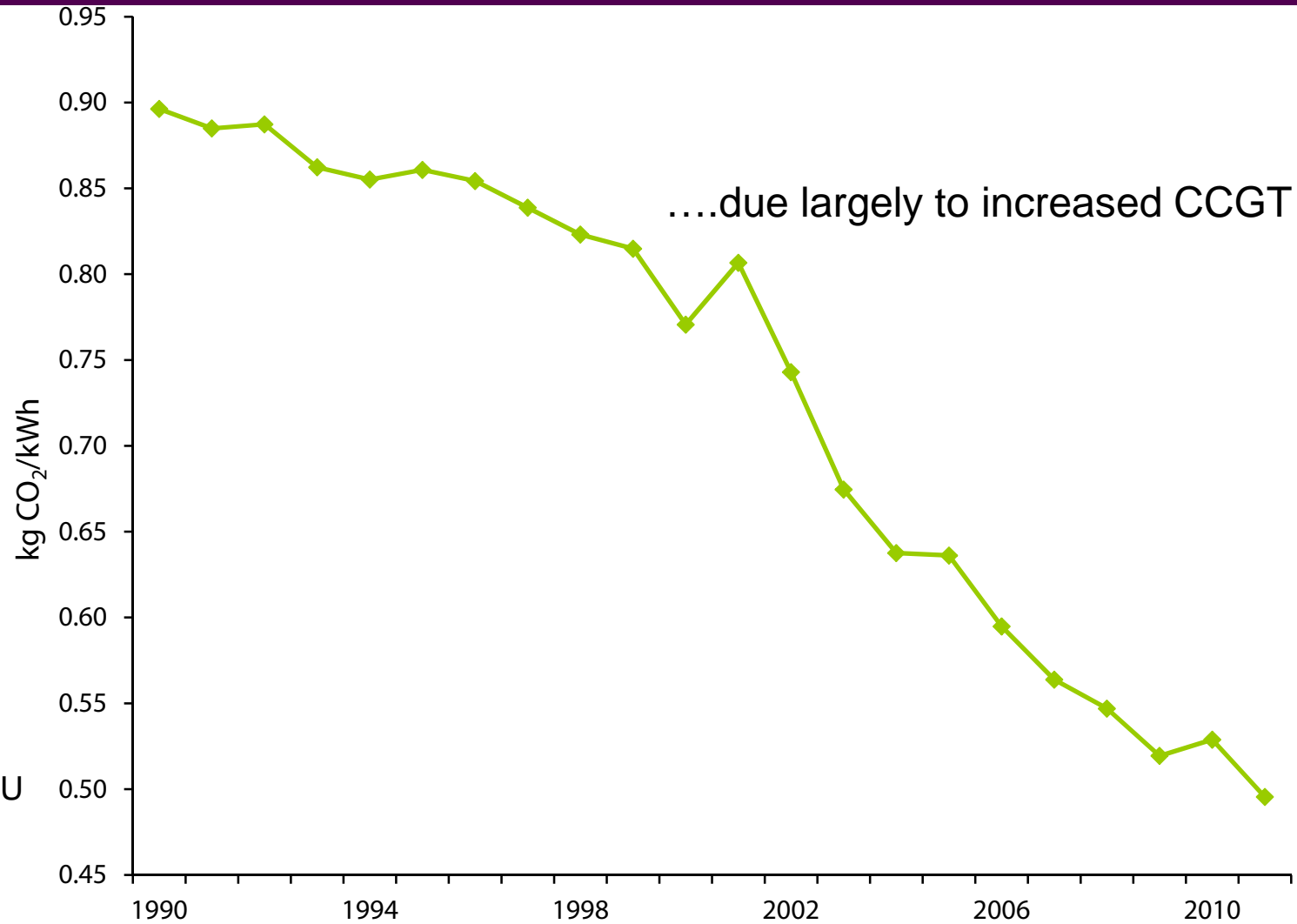
Thank You



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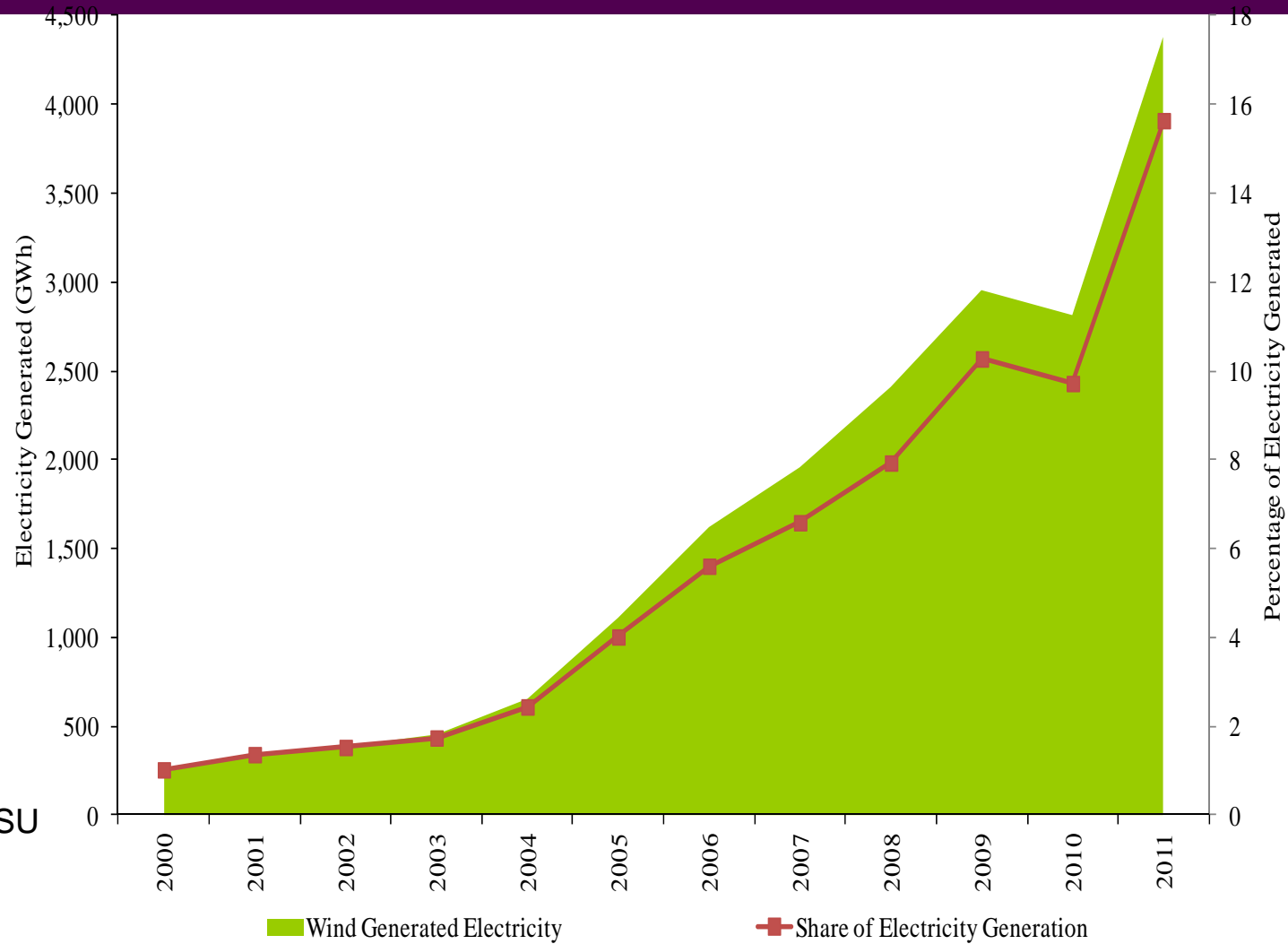


... decarbonised electricity



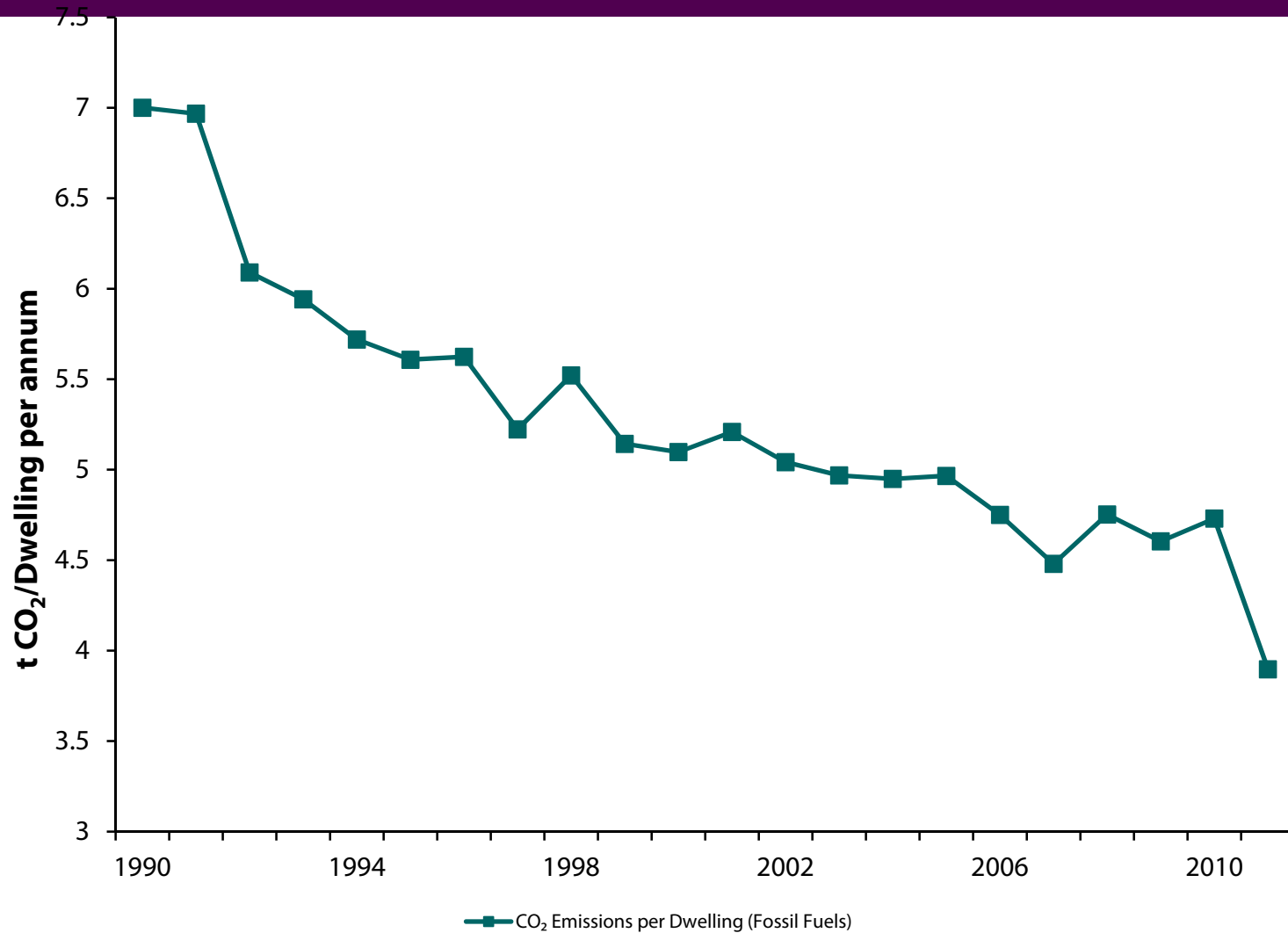
Source:
SEAI EPSSU

.. plus wind energy deployment



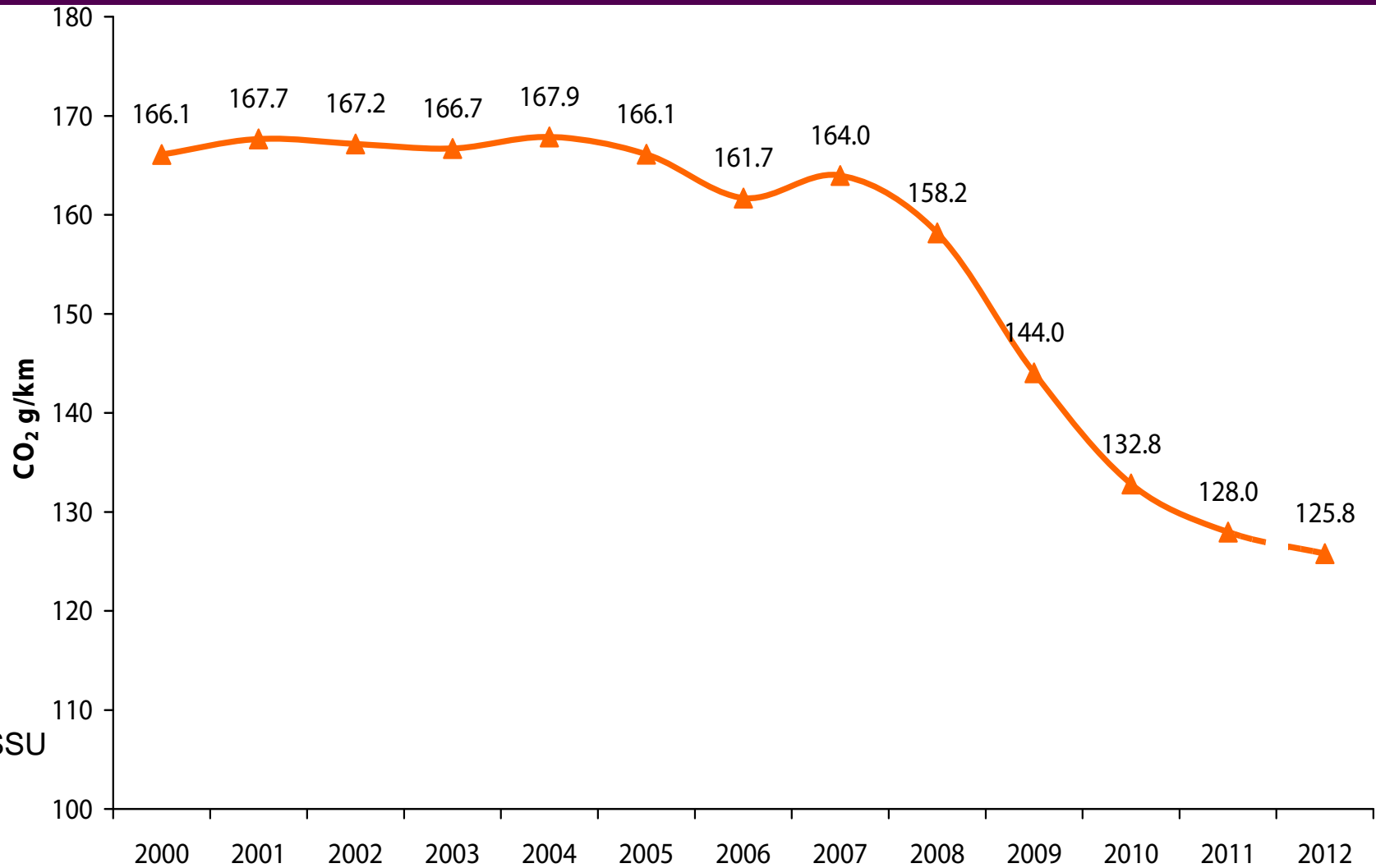
Source:
SEAI EPSSU

... plus EE policy fuel switching in households



Source:
SEAI EPSSU

.... plus new car taxation policy



Source:
SEAI EPSSU