Carbon emissions displaced by Energy Savings

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Low carbon mix : May I waste my electricity ?

In France, electricity is **nearly** carbon free…

In fact there is still about **30 million tons of CO_2** in the electric generation sector (more than in the **steel industry**)

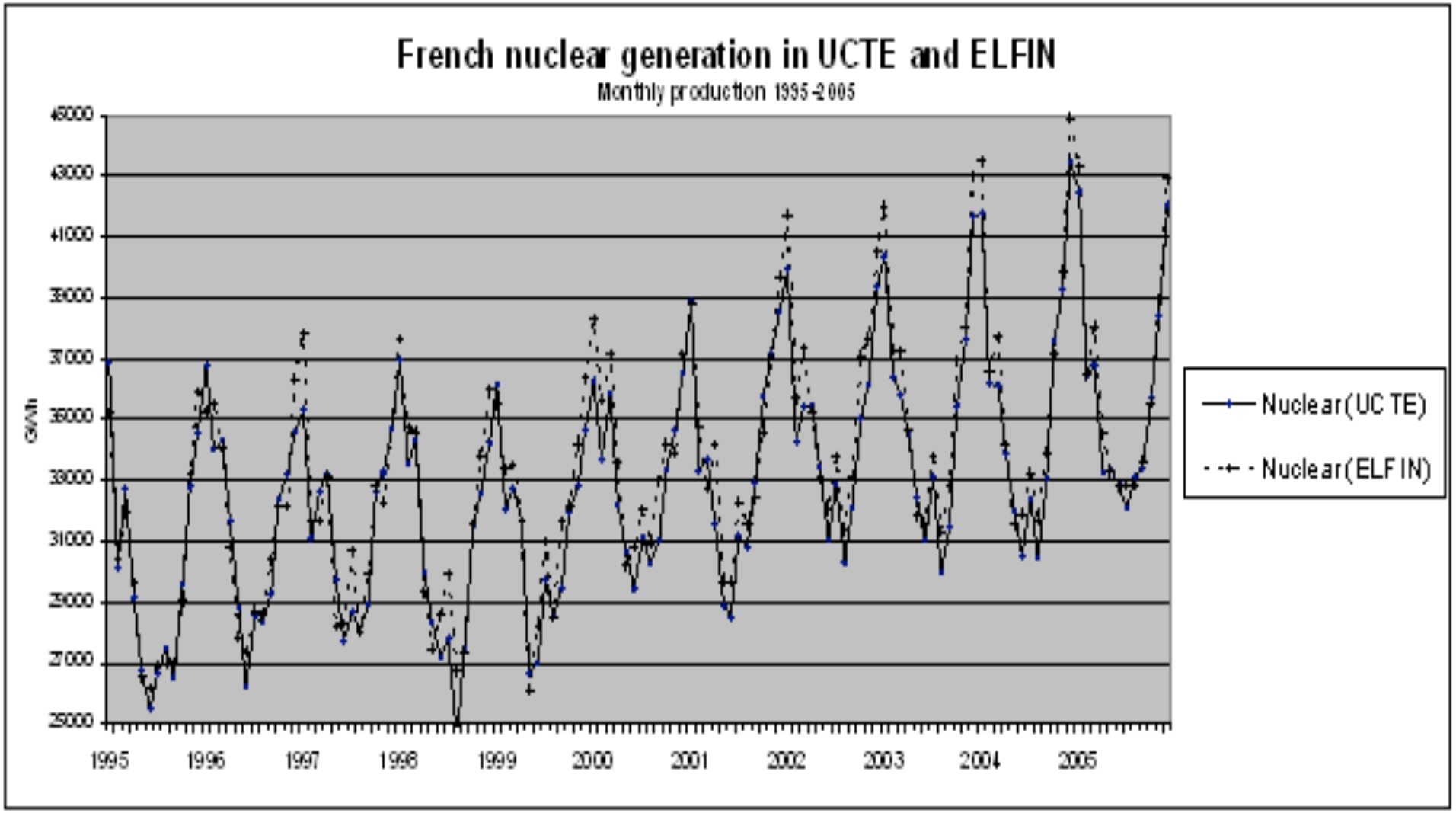
But how do I allocate this carbon?

How much carbon do I save if I change a light-bulb?

The research : How to model it

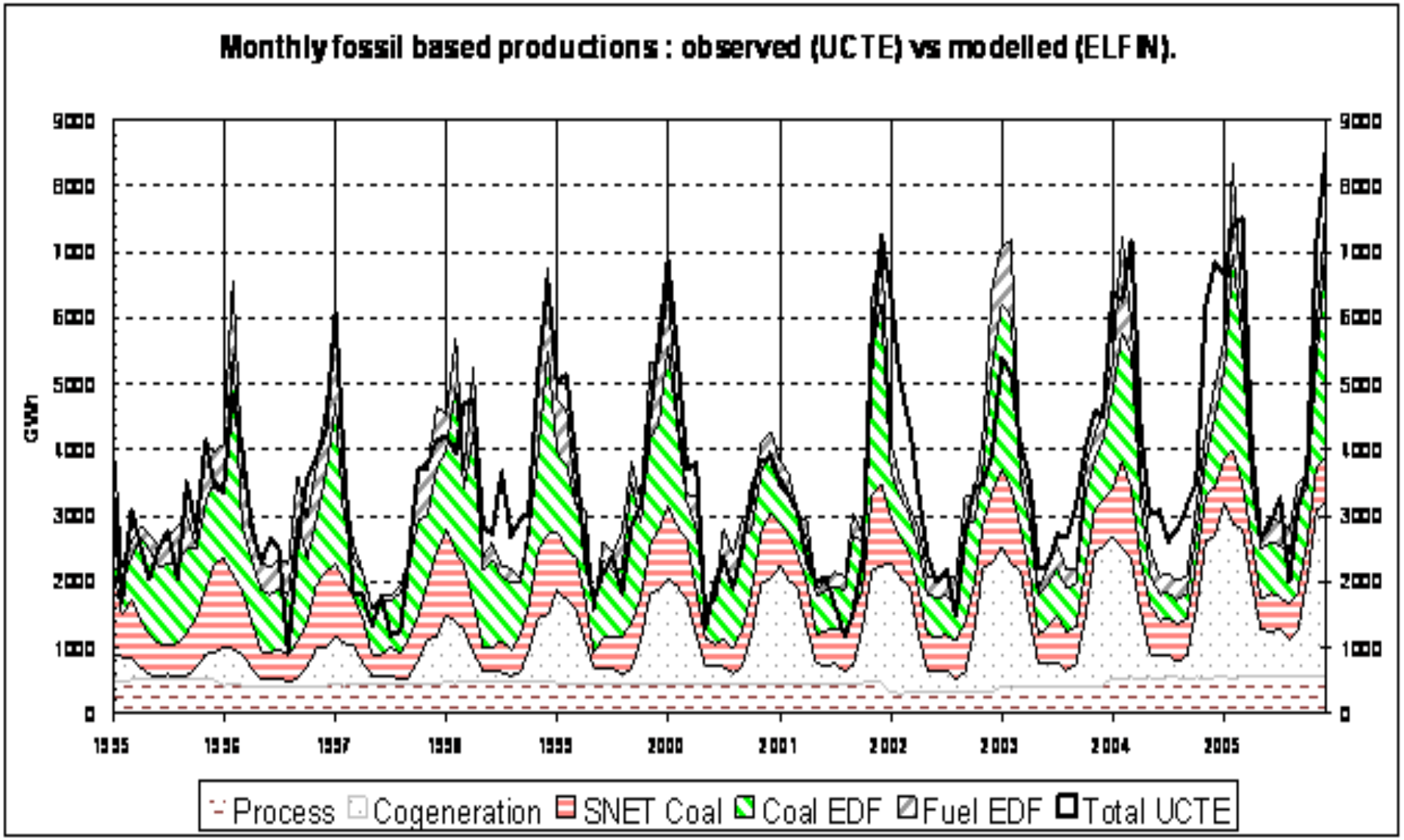
1. Modelling with ELFIN (Electricity Financing). Does it match the situation of France? Does it match the base-load sources? The marginal sources?
2. Quantify the future emissions reductions as would a CDM project developer.
3. Discussions on avoided energy

Ten years test : match of baseload



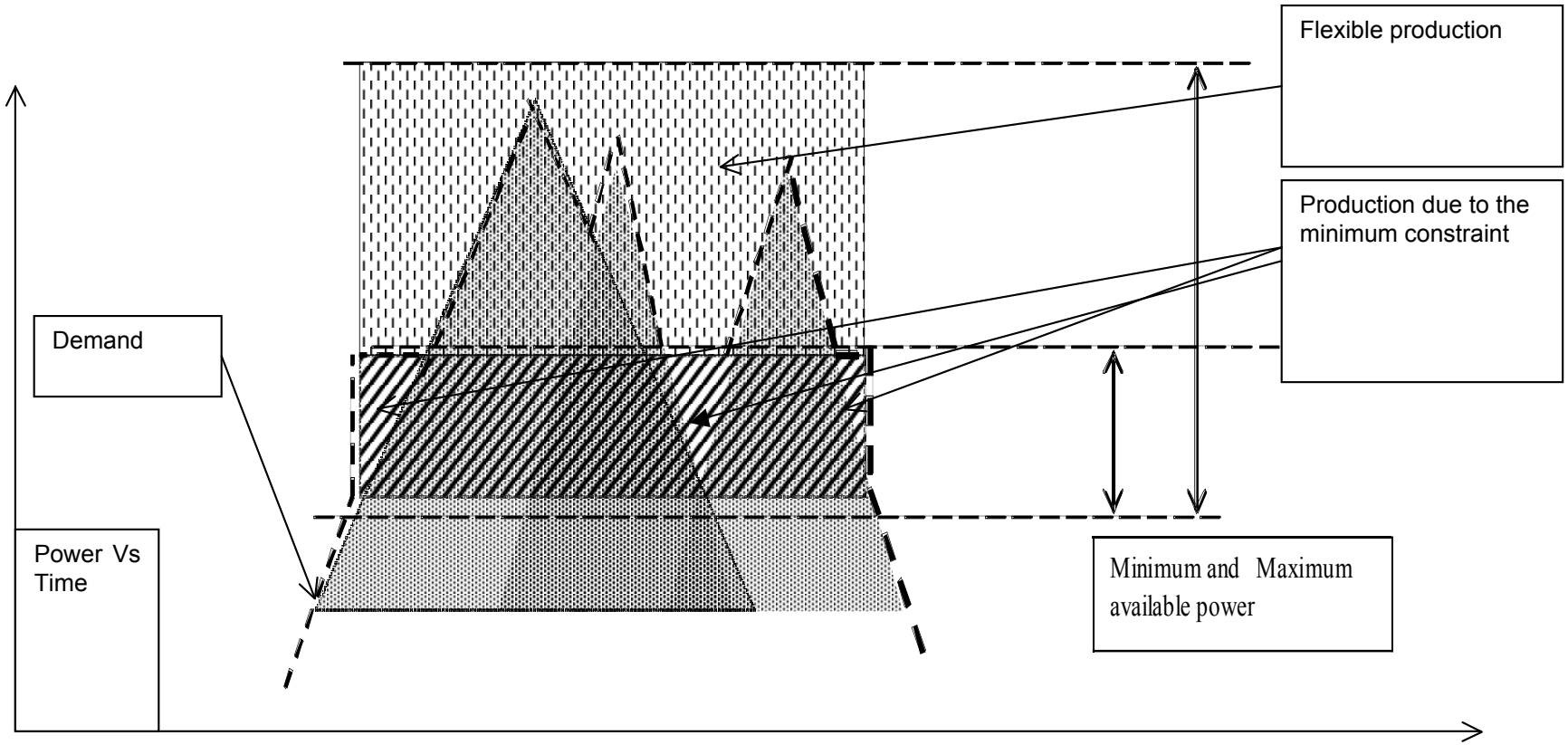
Part 1

Ten years test: marginal sources



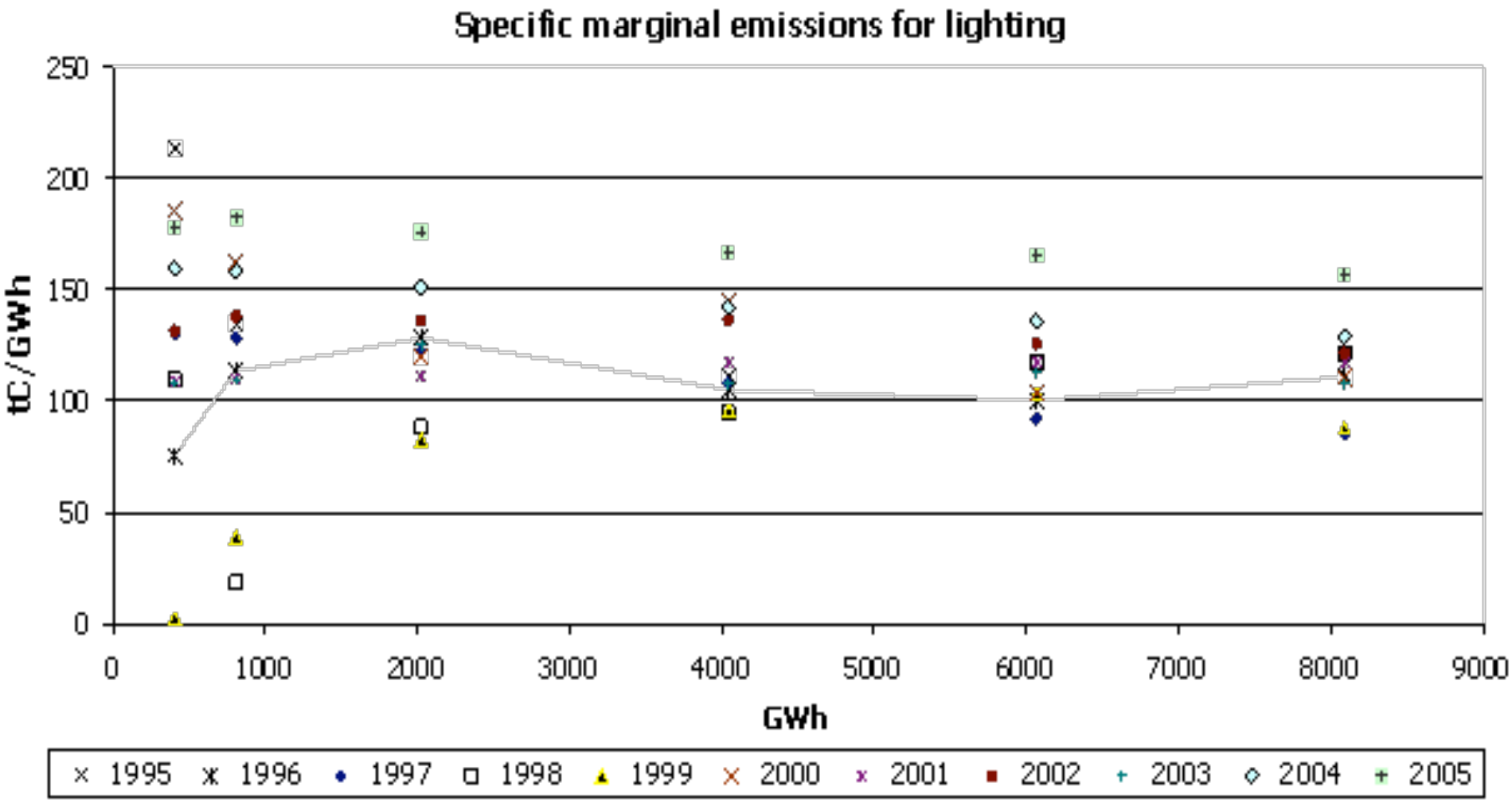
Include technical parameters

- Steam based plant / minimum constraint



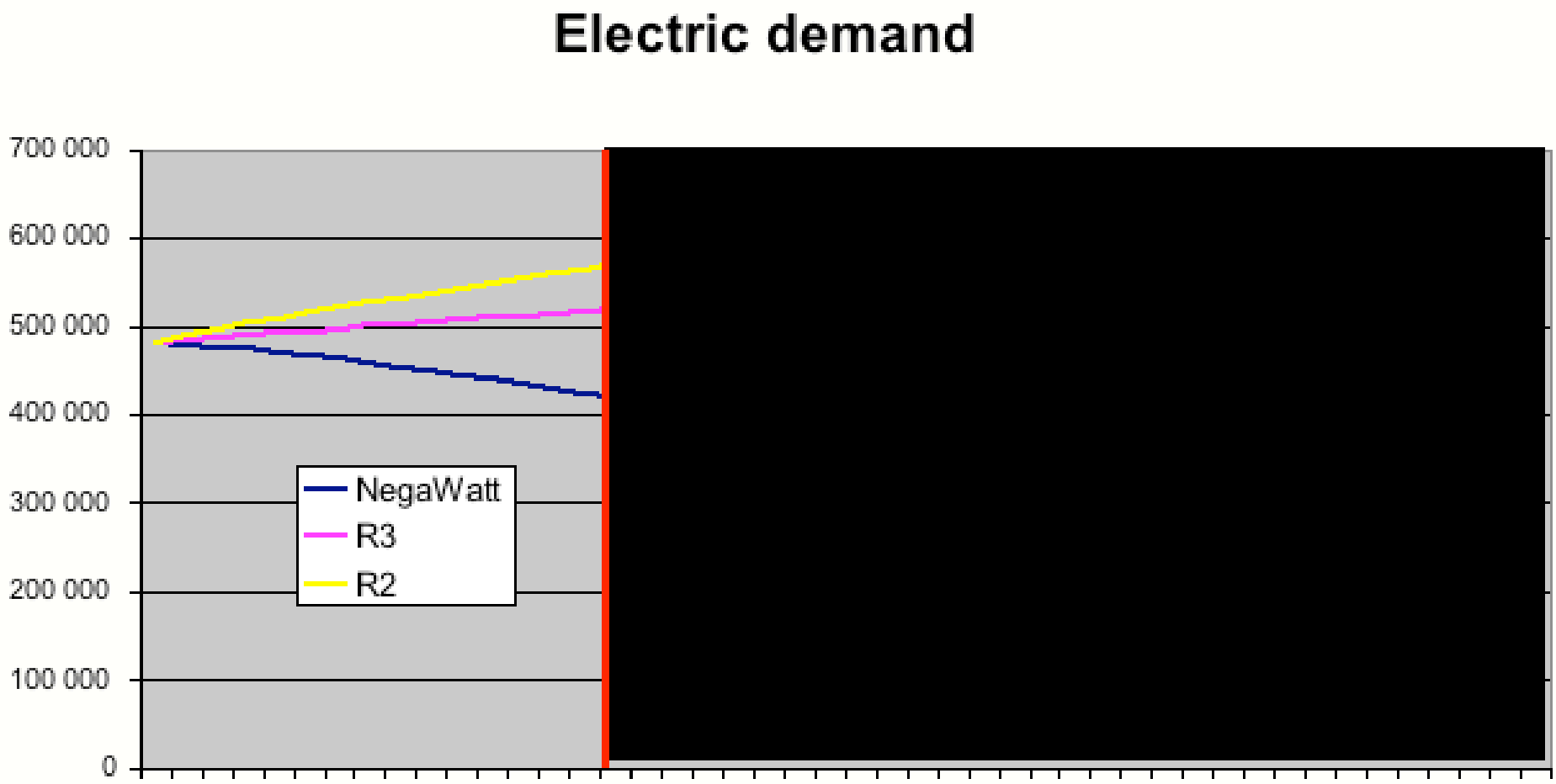
Part 1

Efficiency tested on past years: dispersion, size effects

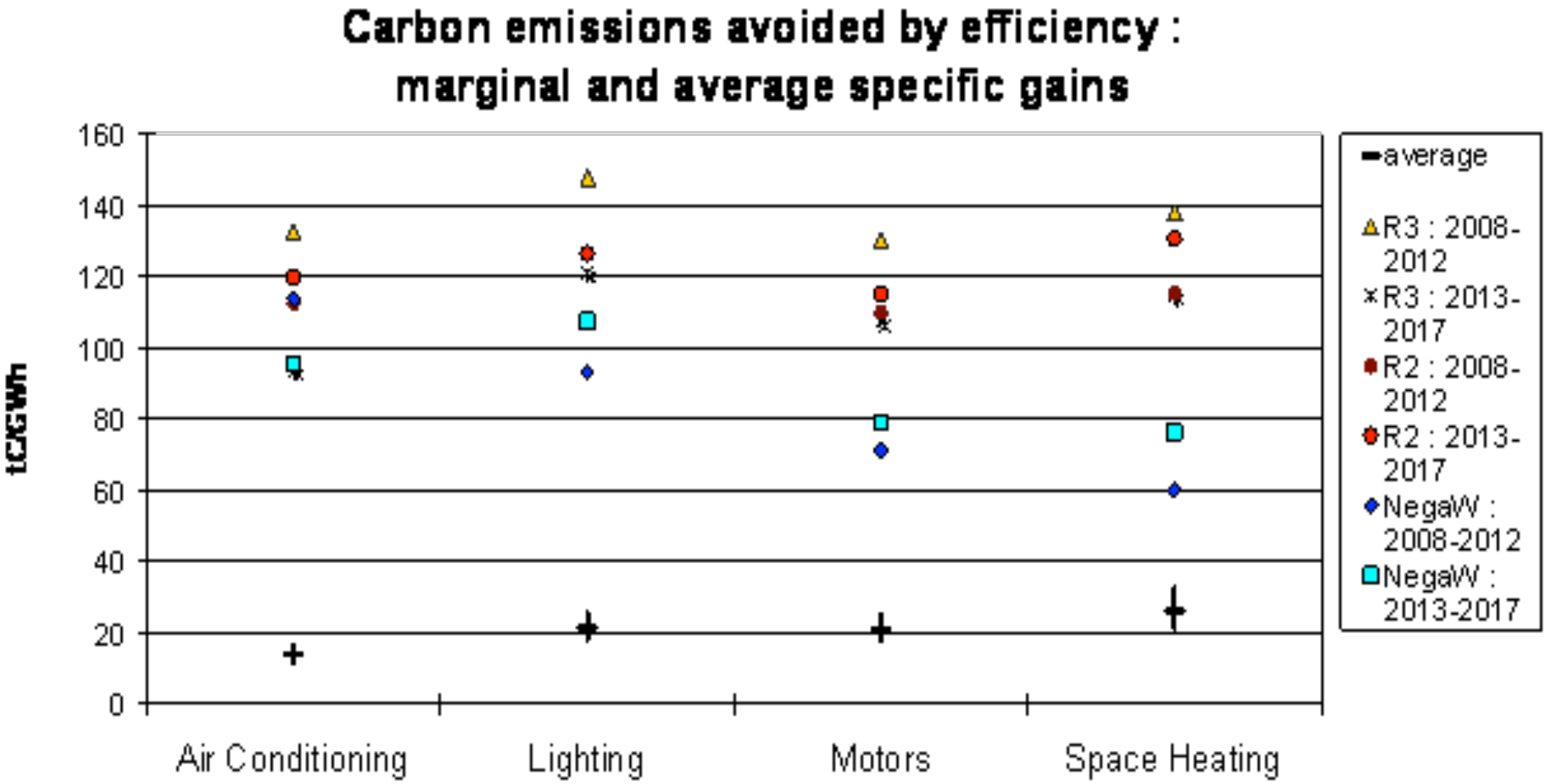


Part 2

Set baselines (as in CDM projects)

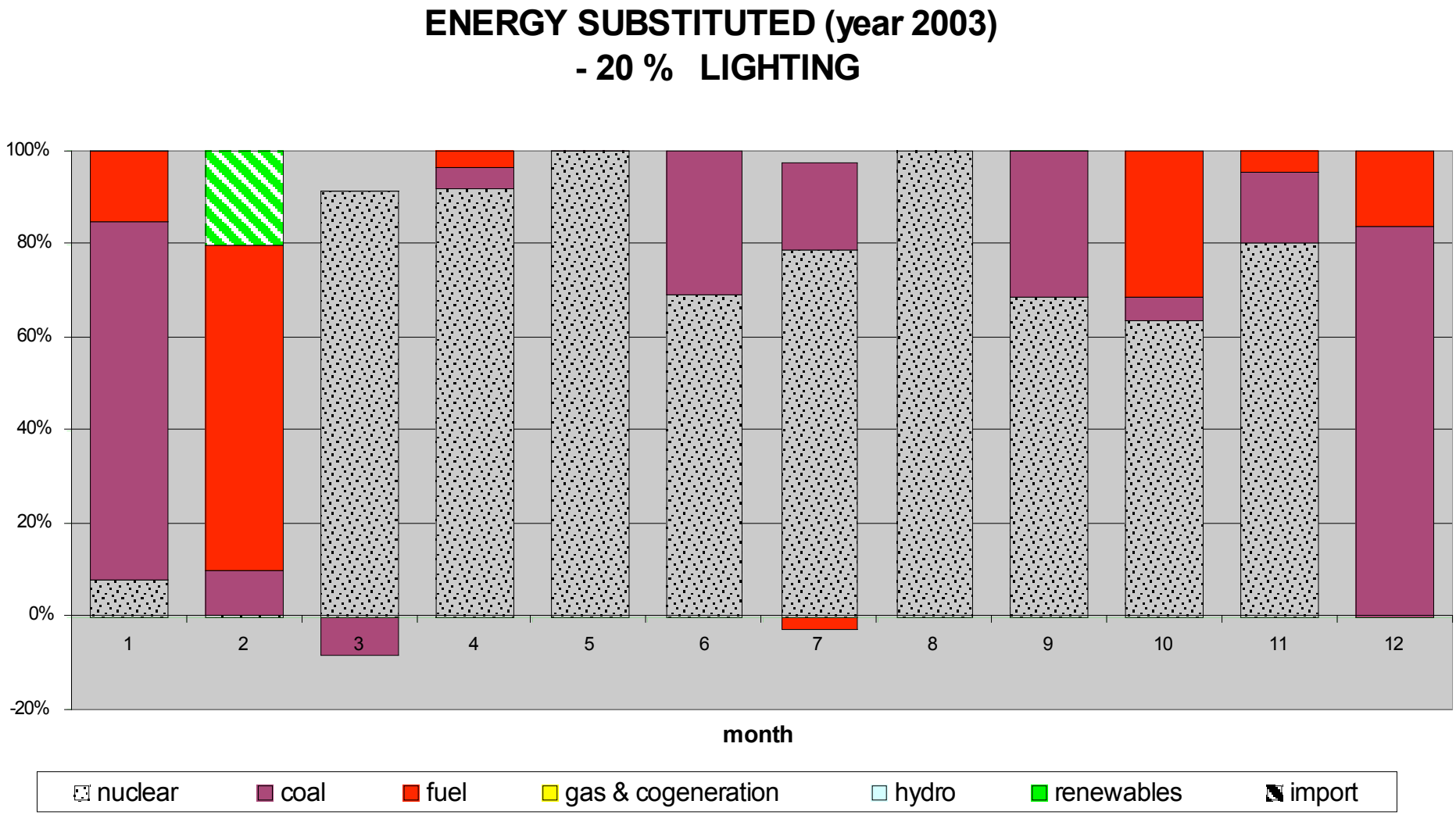


Main result : impact of efficiency



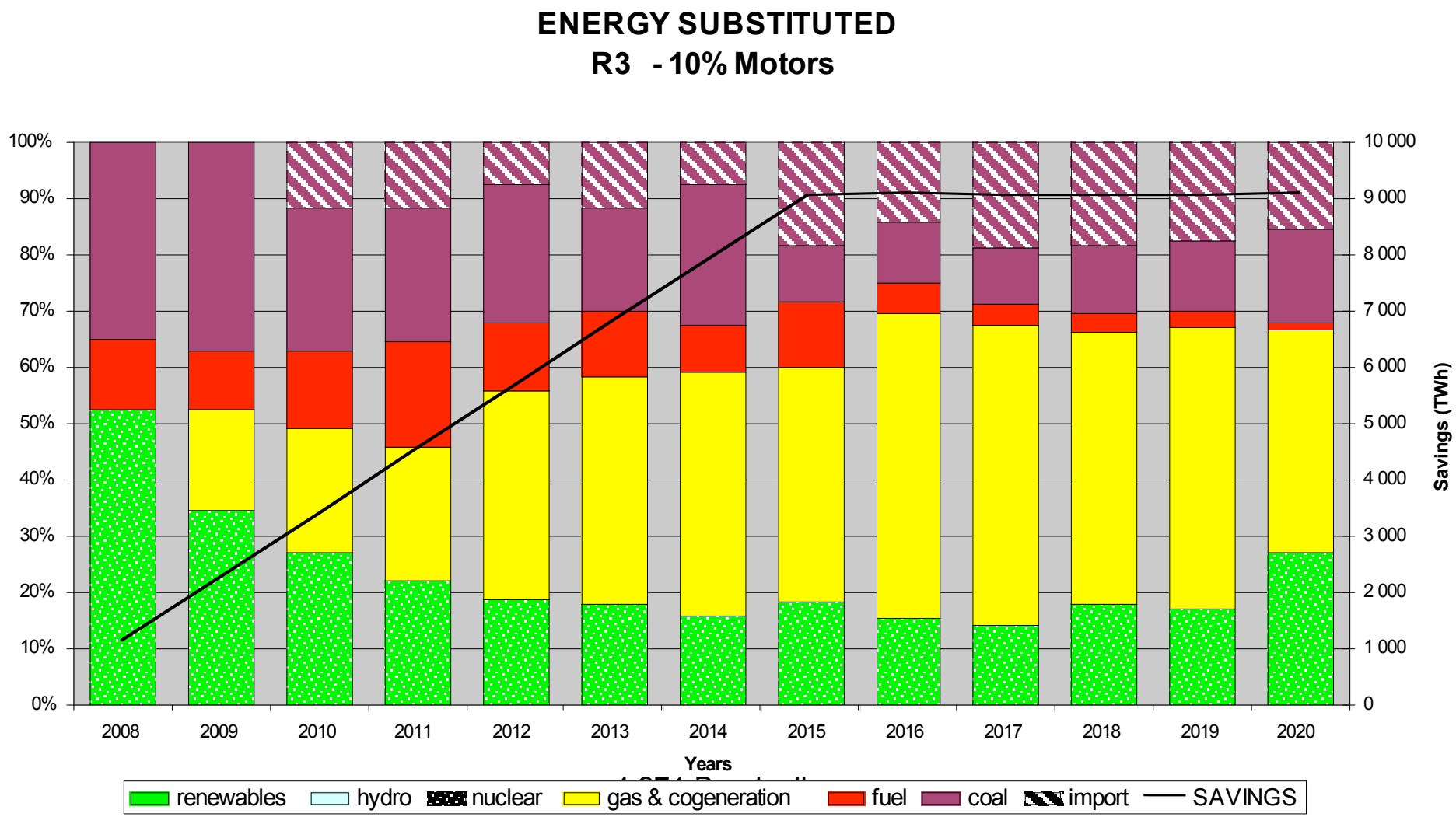
Part 3

Time of year do matter



Part 3

Future emissions : no decrease



Other observations

- Low carbon uses do exist (but still no no-carbon uses)
- Time of year do matter
- New gas replaces old coal but no decrease in carbon impacts of efficiency
- Not much size effect on content
- Baselines do matter much (like in CDM)

How many light bulbs does it take to remove one ton of carbon ?

- Depends on the time of usage
- Depends on the year of usage
- Depends a little on the other efficiency programs
- Depends on the Germans and on the rules of ETS allocation
- But we can quantify it (and maybe agree on it)...

Conclusion : next issues to be researched:

- The impacts on the continental system (Germany, Benelux) of electricity imports and exports with their possible consequences on the carbon trading
- Discussions among Public Departments of the consequences of (i.a.) building standards
- Policy discussion on present power additions (Gas CC) in the National Climate Change strategy, and discussion of the allocation of carbon allowances.

Thank you for your attention

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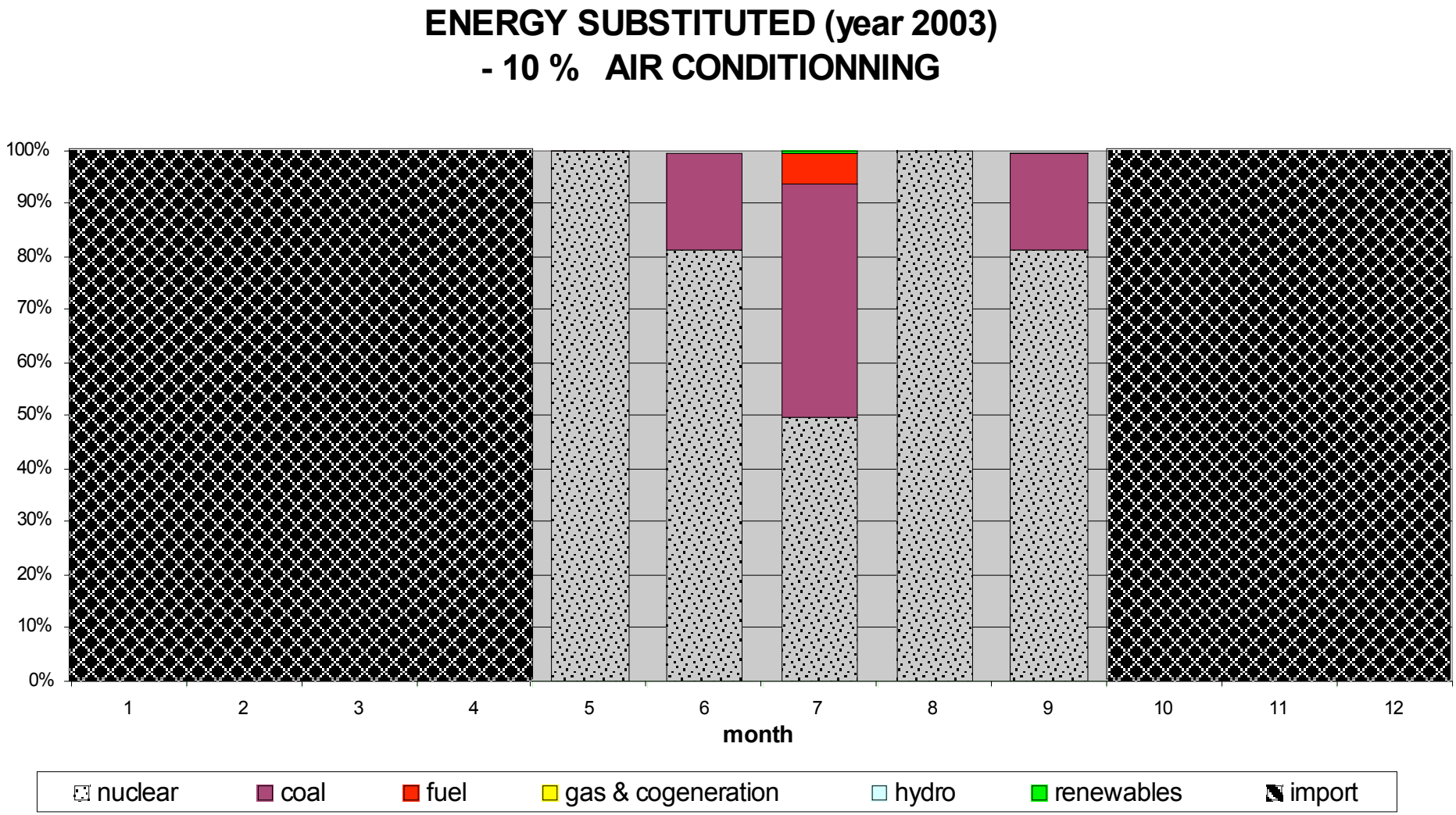
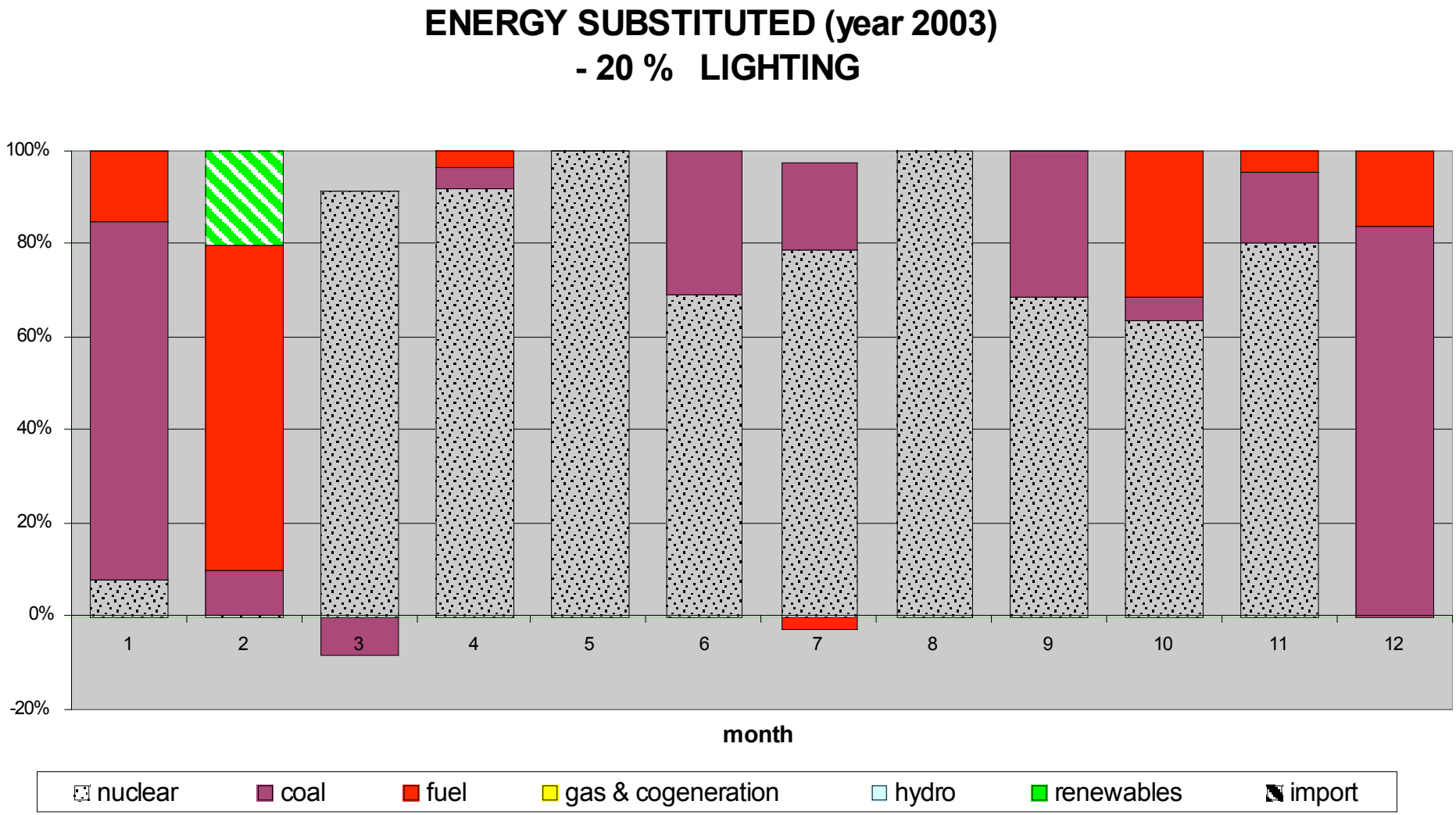
Part 3

Low carbon uses do exist



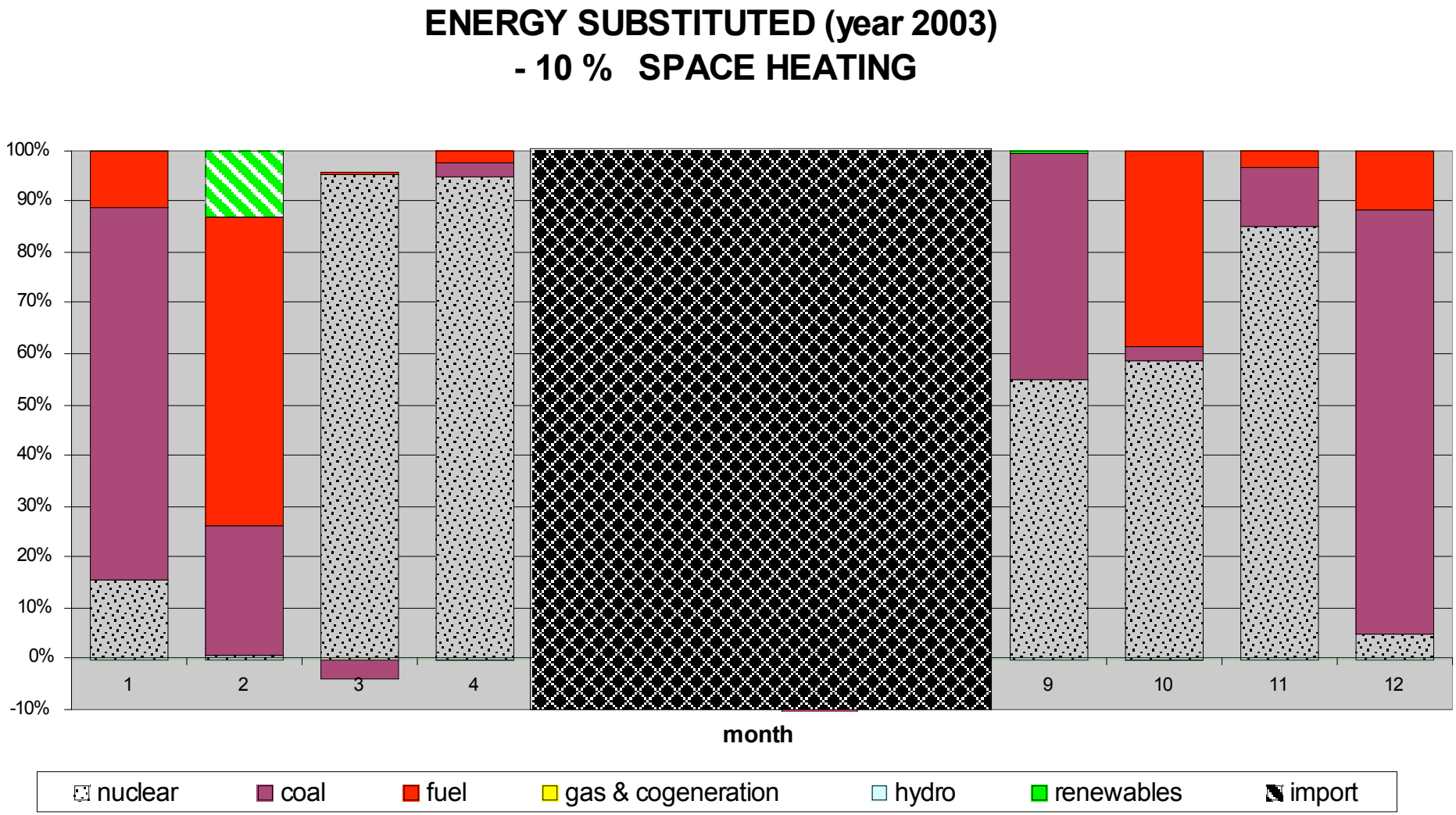
Part 3

Time of year do matter



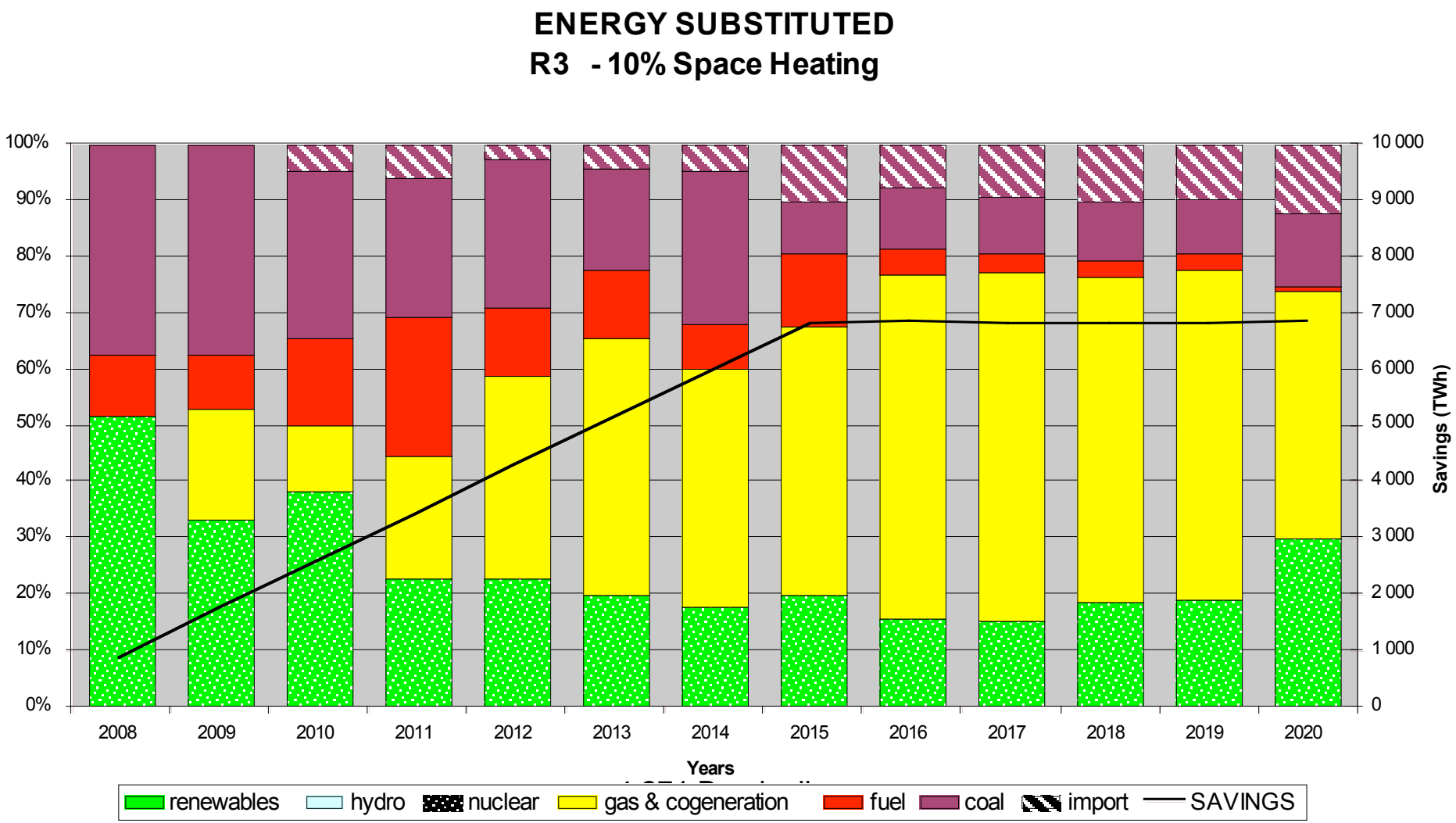
Part 3

More contentious : electric heating



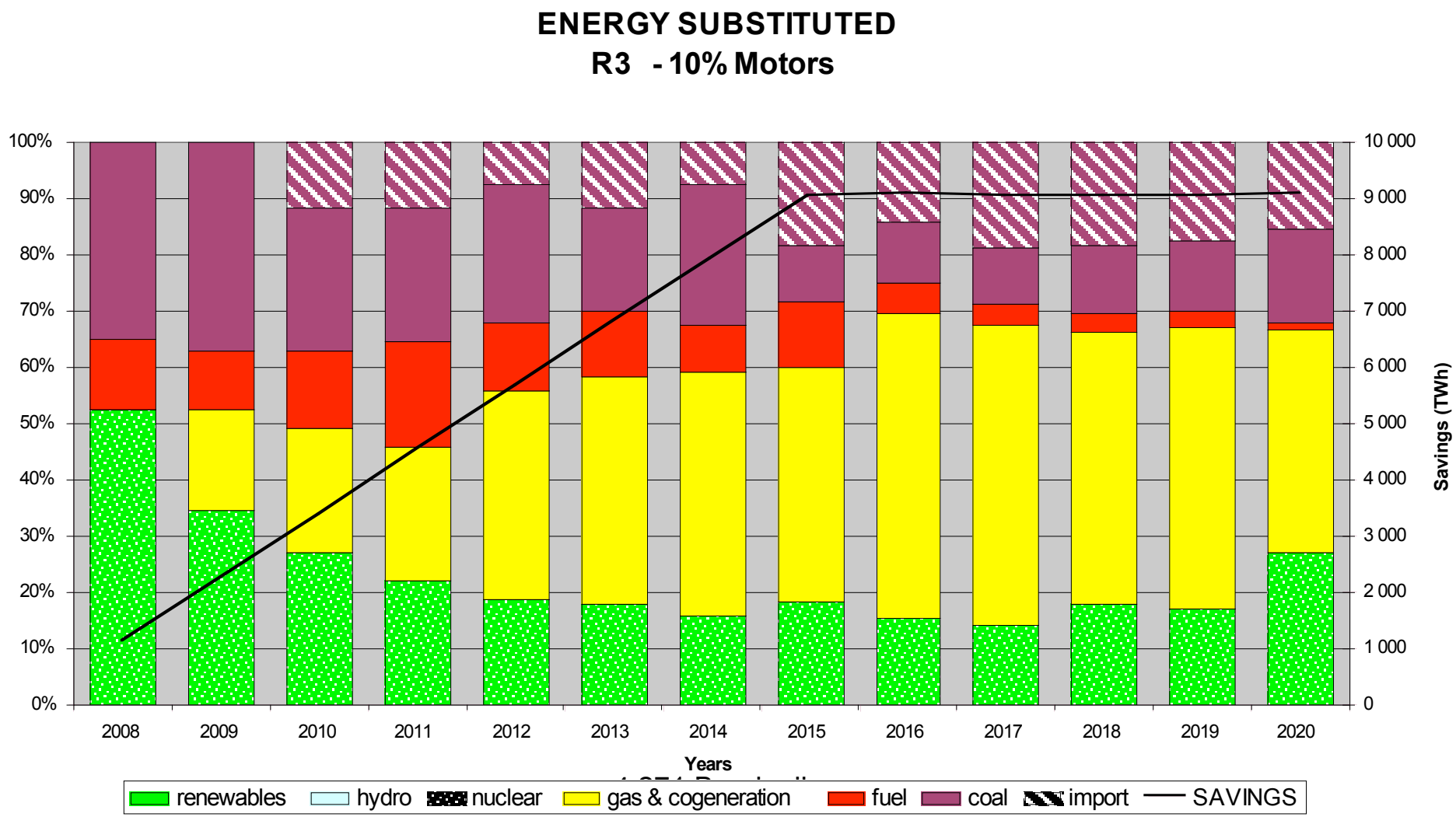
Part 3

Future peak substitution : new gas



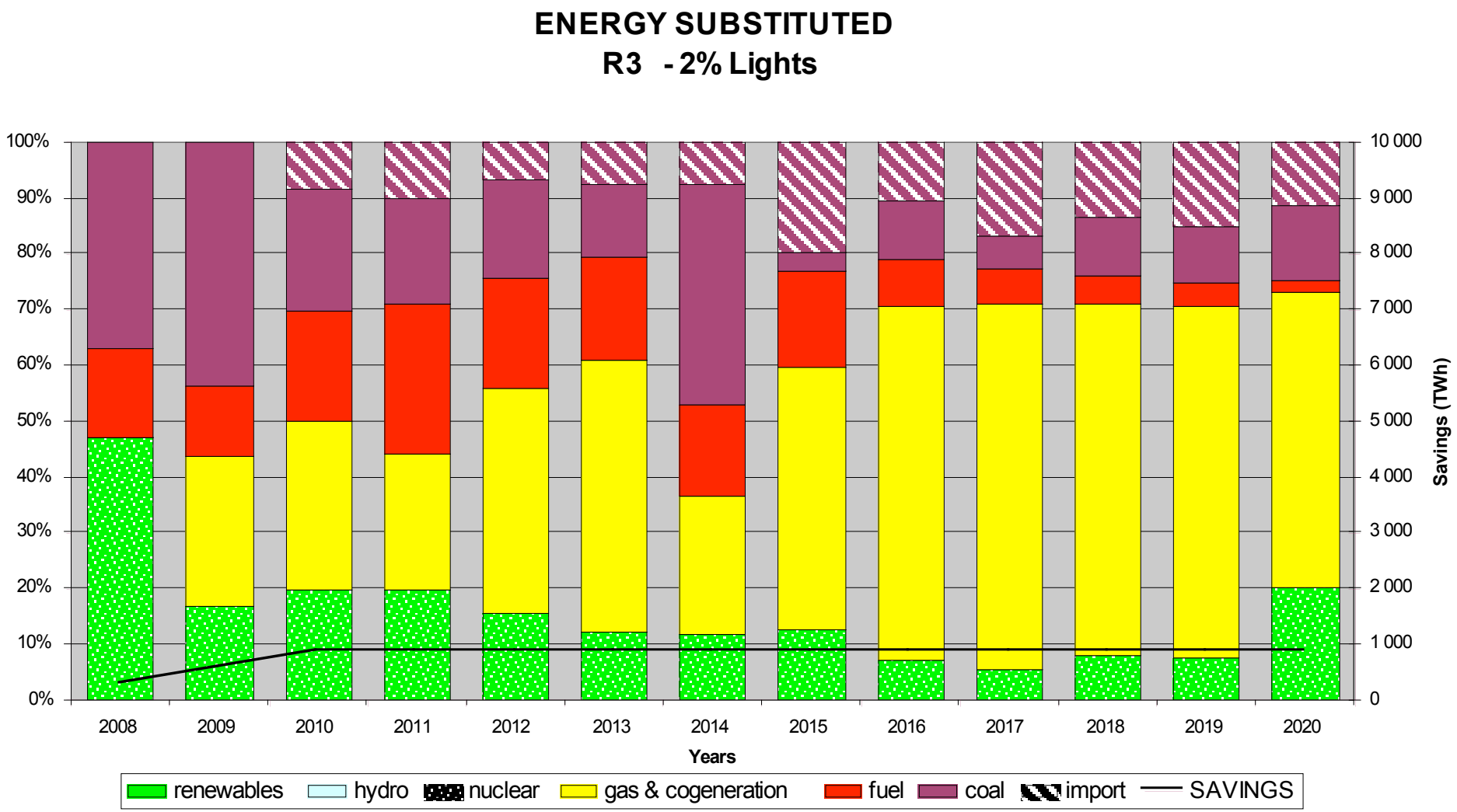
Part 3

Future emissions : no decrease



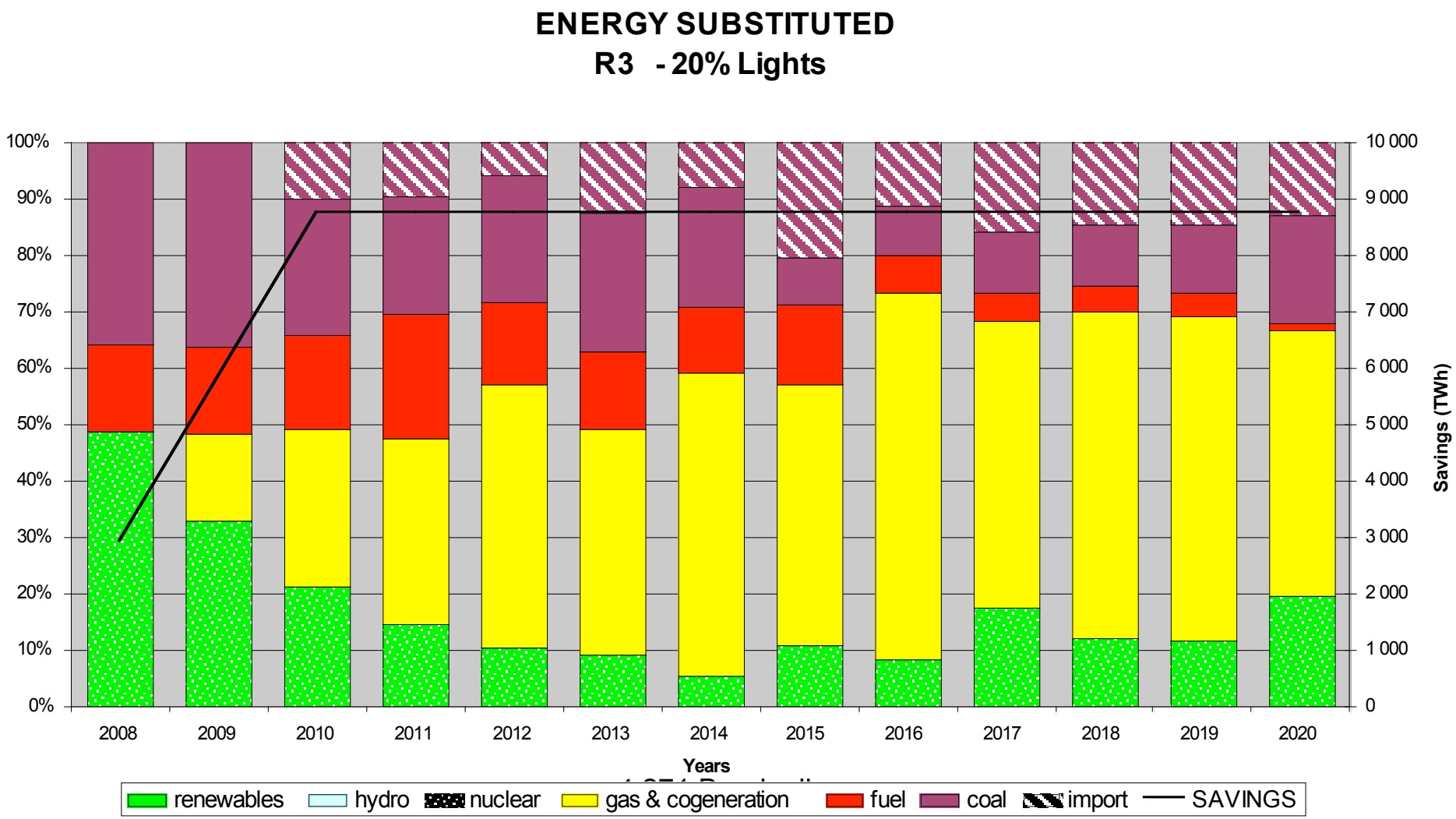
Part 3

Size effect of programs ?



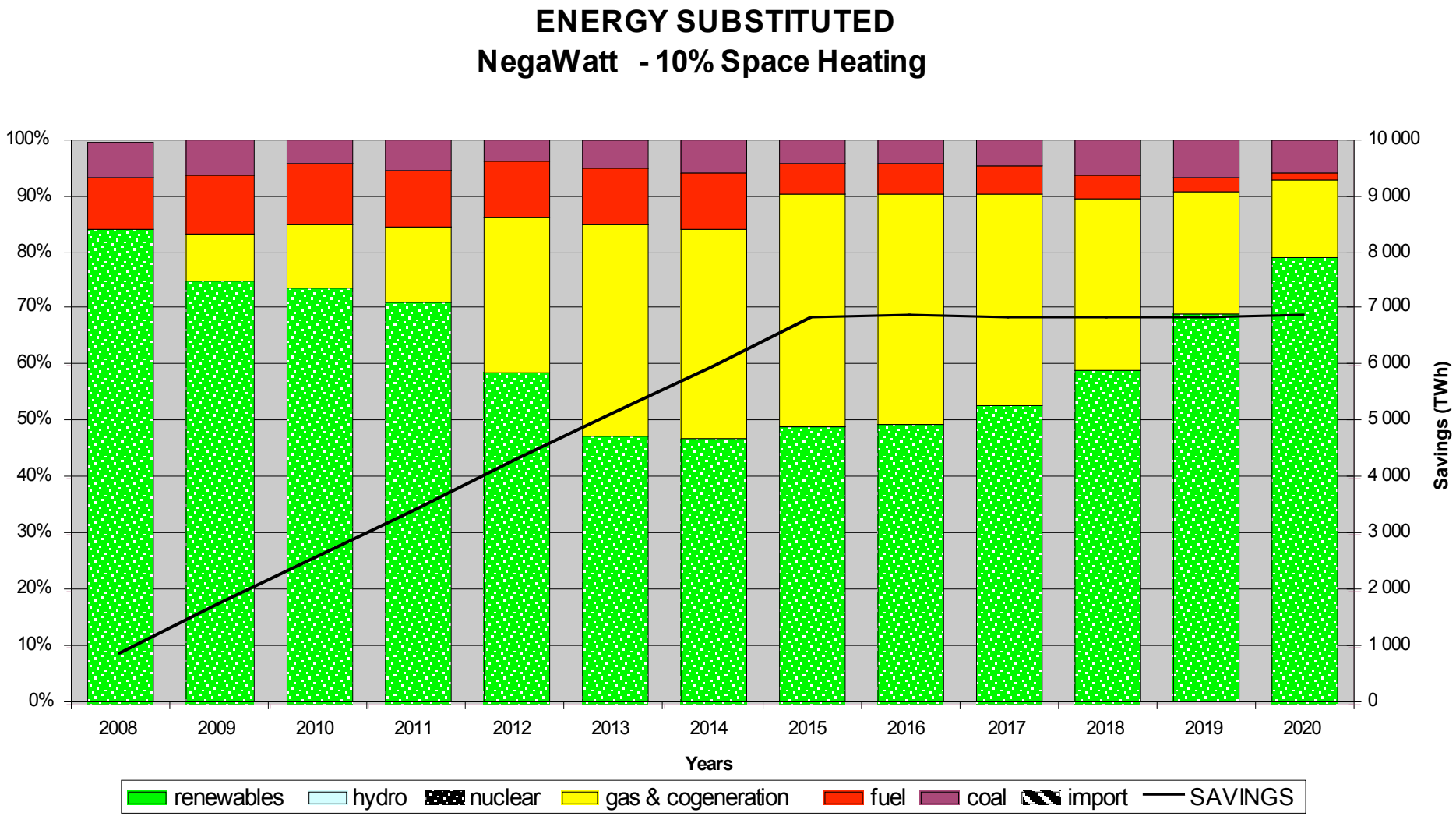
Part 3

Limited size effect (2% vs 20%)

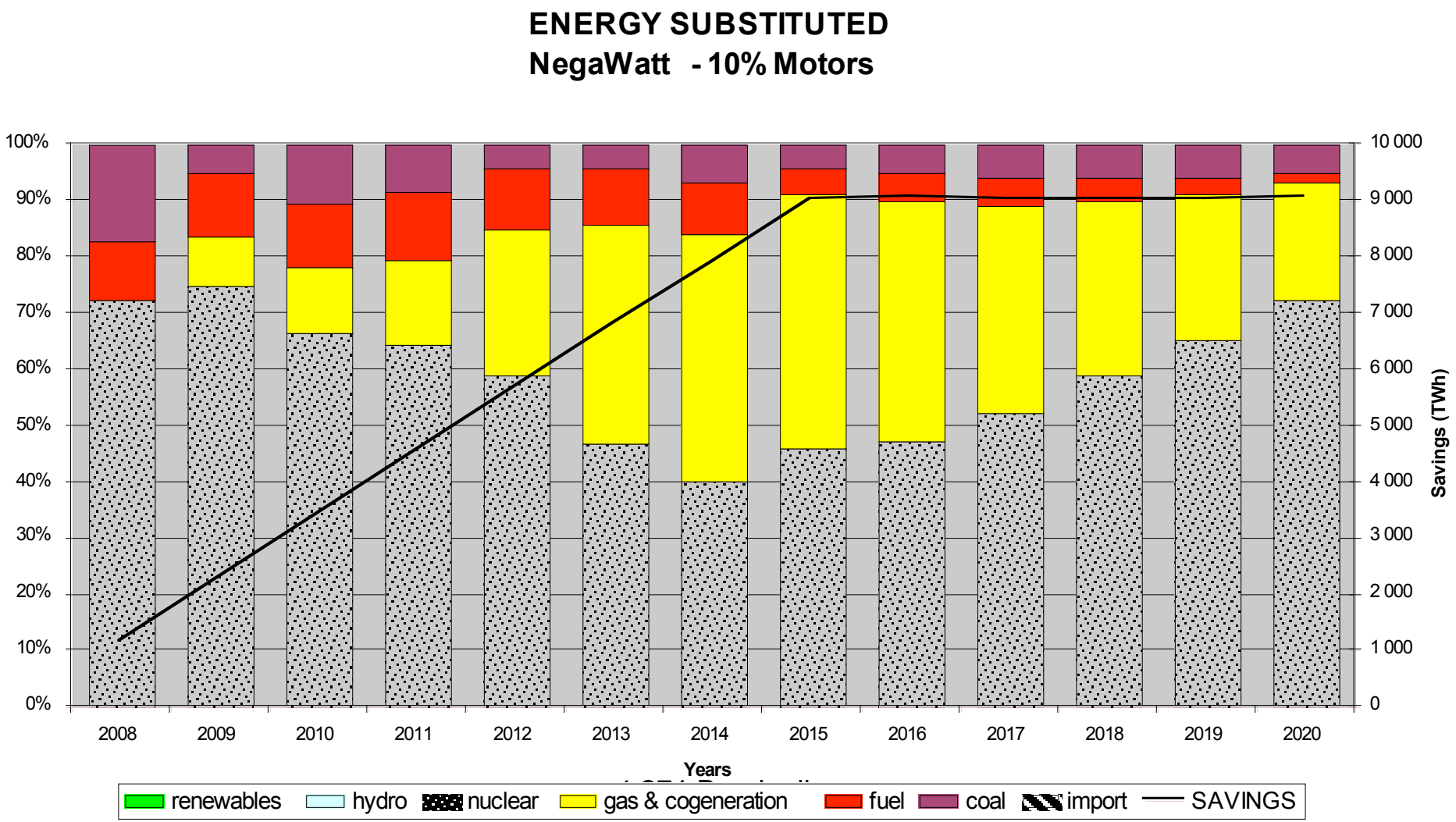


Part 3

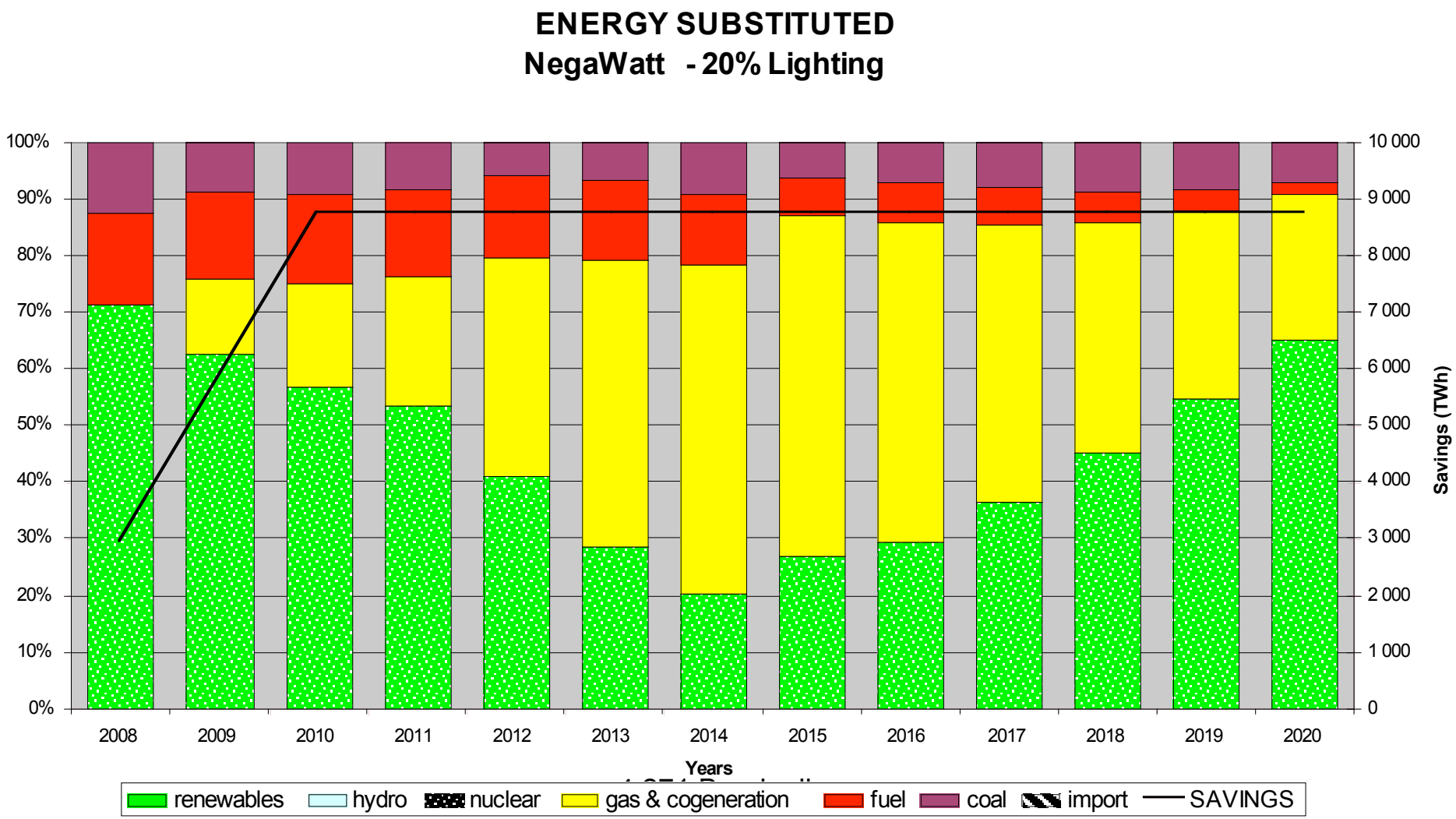
Baselines do matter



Part 3


ENERGY SUBSTITUTED
NegaWatt - 10% Motors
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
10 000
9 000
8 000
7 000
6 000
5 000
4 000
3 000
2 000
1 000
0
Savings (TWh)
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Years
renewables
hydro
nuclear
gas & cogeneration
fuel
coal
import
SAVINGS

Part 3


ENERGY SUBSTITUTED
NegaWatt - 20% Lighting
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
10 000
9 000
8 000
7 000
6 000
5 000
4 000
3 000
2 000
1 000
0
Savings (TWh)
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Years
renewables
hydro
nuclear
gas & cogeneration
fuel
coal
import
SAVINGS