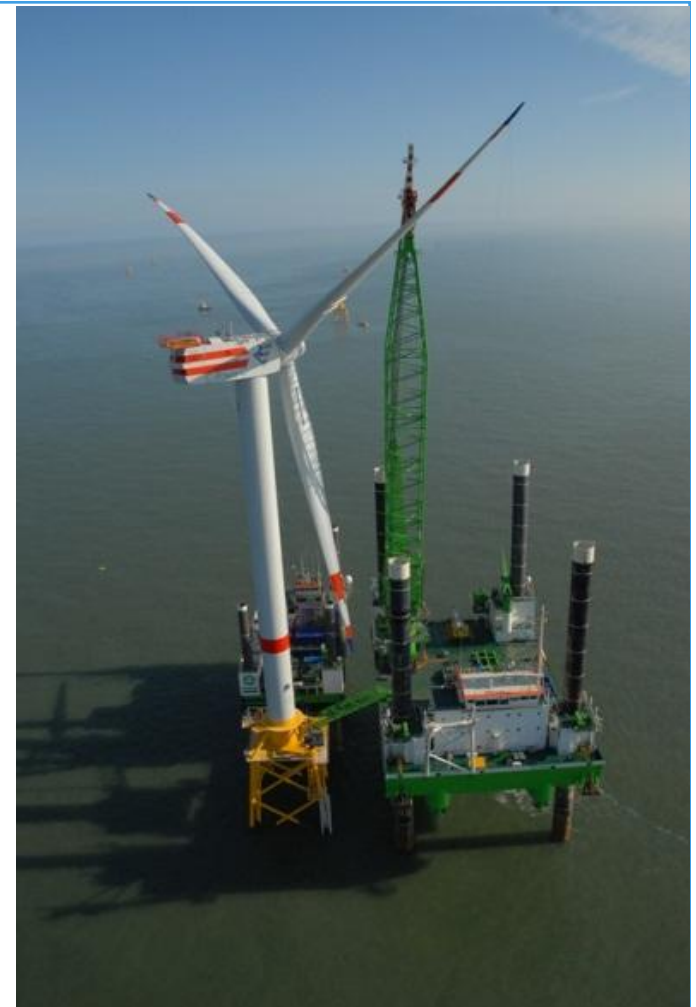


The C-Power offshore wind farm & the environment:

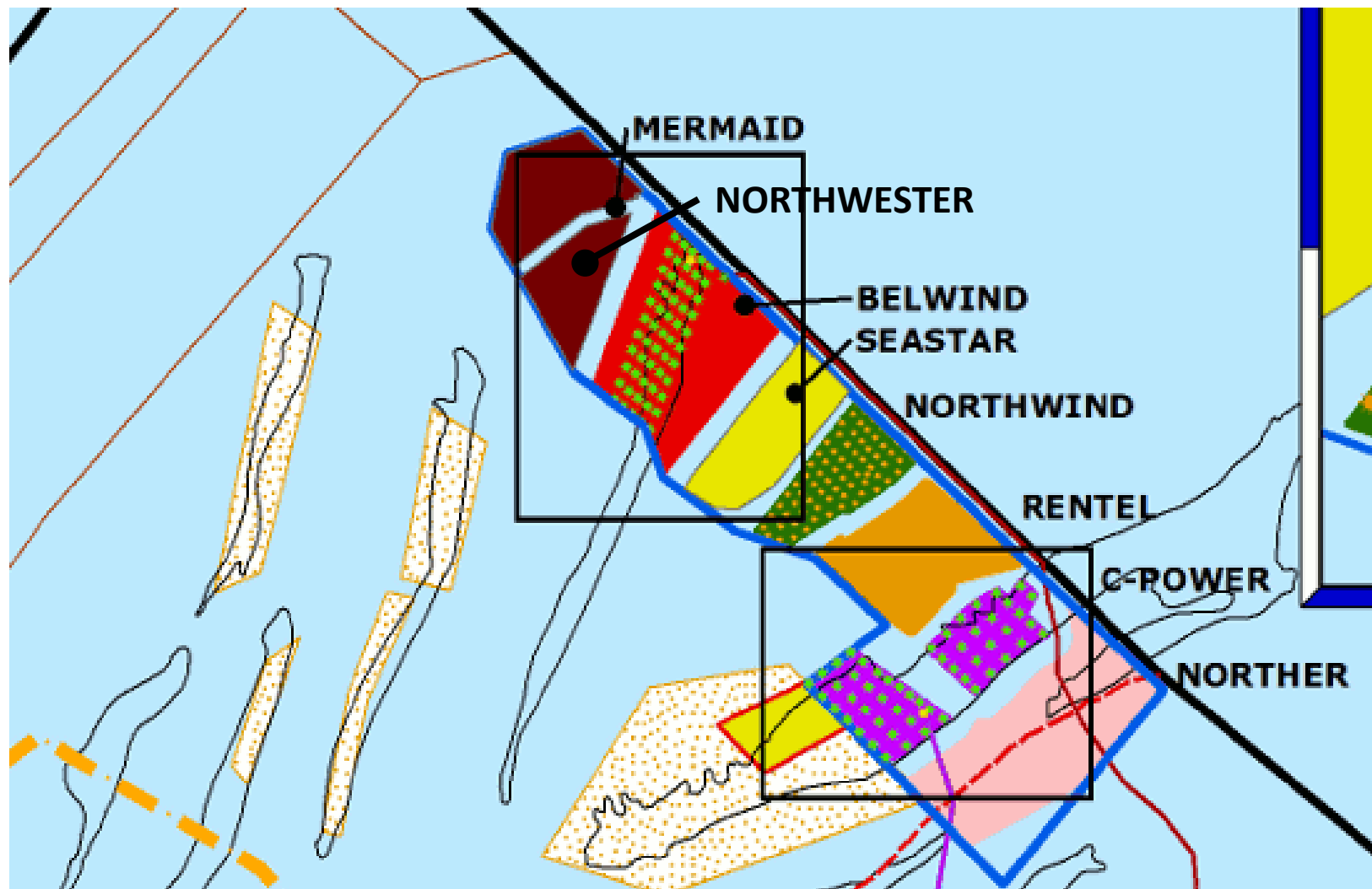
The bigger picture

26/11/2013

Jaak Rutten – CEO



Concessions in the Belgian North Sea



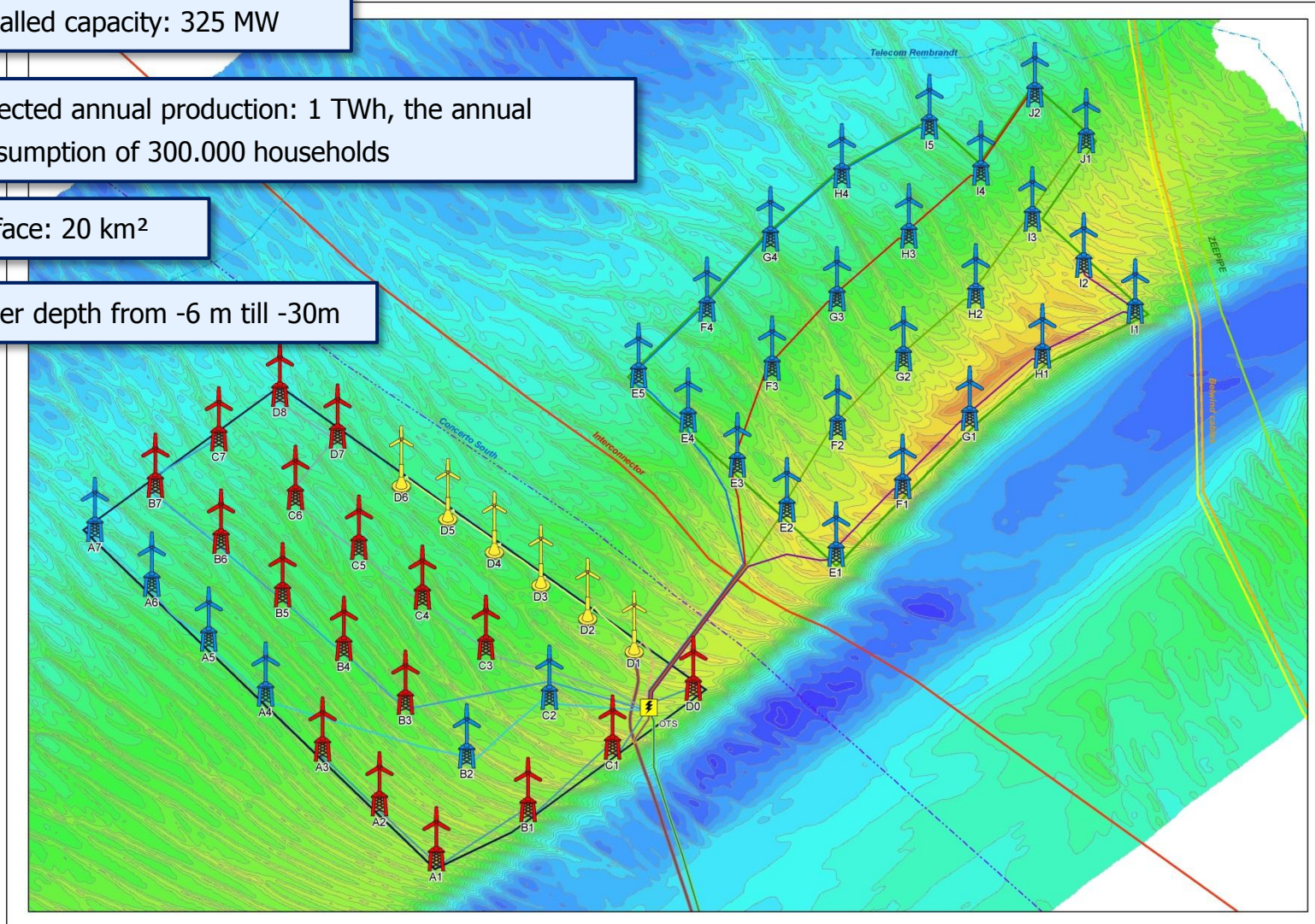
Concession

✓ Installed capacity: 325 MW

✓ Expected annual production: 1 TWh, the annual consumption of 300.000 households

✓ Surface: 20 km²

✓ Water depth from -6 m till -30m



Wind energy = clean and zero-carbon energy

"Energy from wind power is clean and renewable, and if there is one overwhelming threat to wildlife and conservation, it is global warming"

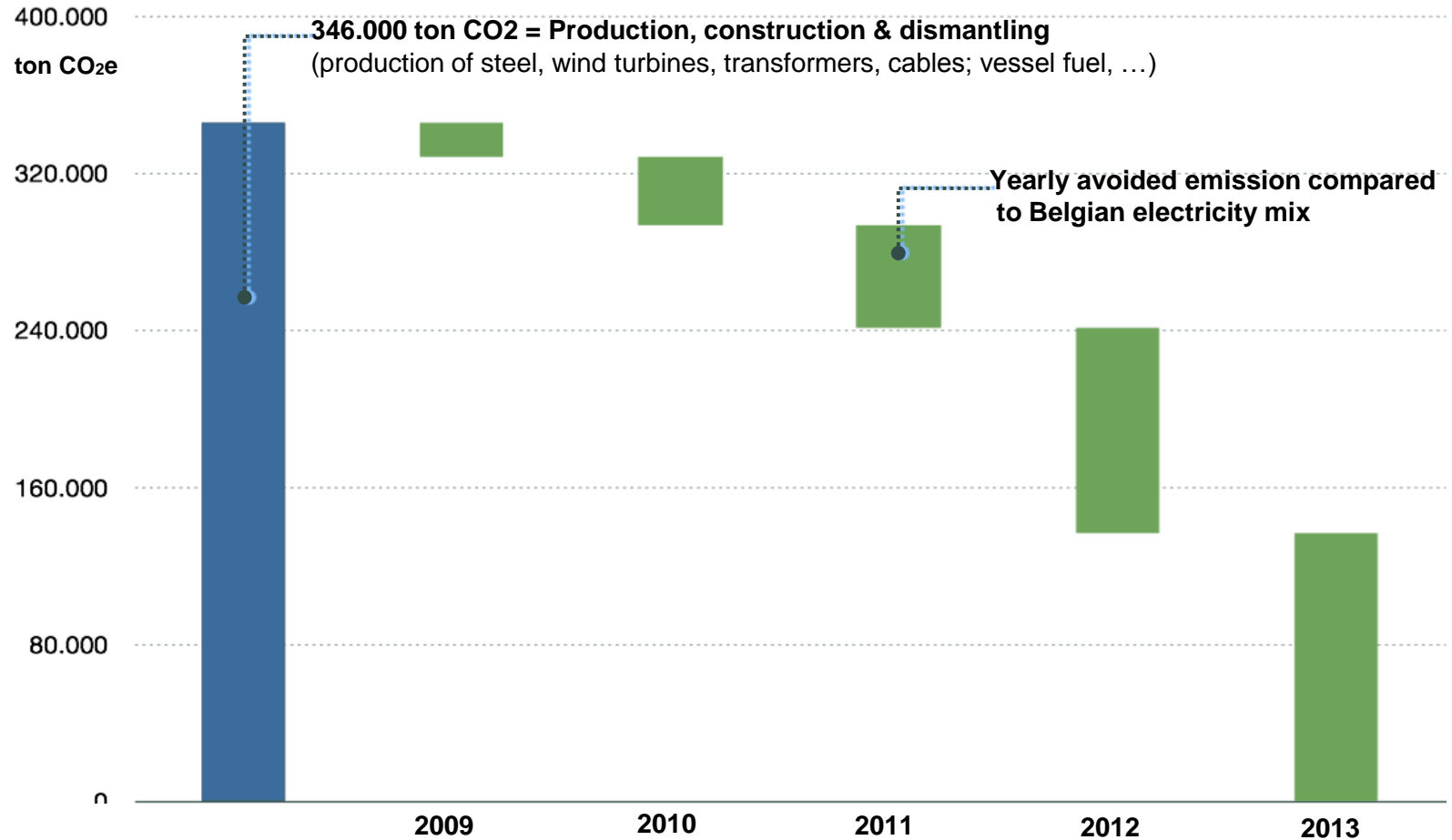
Nick Shelton, RSPB (The Royal Society for the Protection of Birds)

Environmental benefits wind energy

- No air pollution (no Particulate Matter (PM), no NO_x,..)
- No toxic, radioactive waste
- No CO₂ emissions

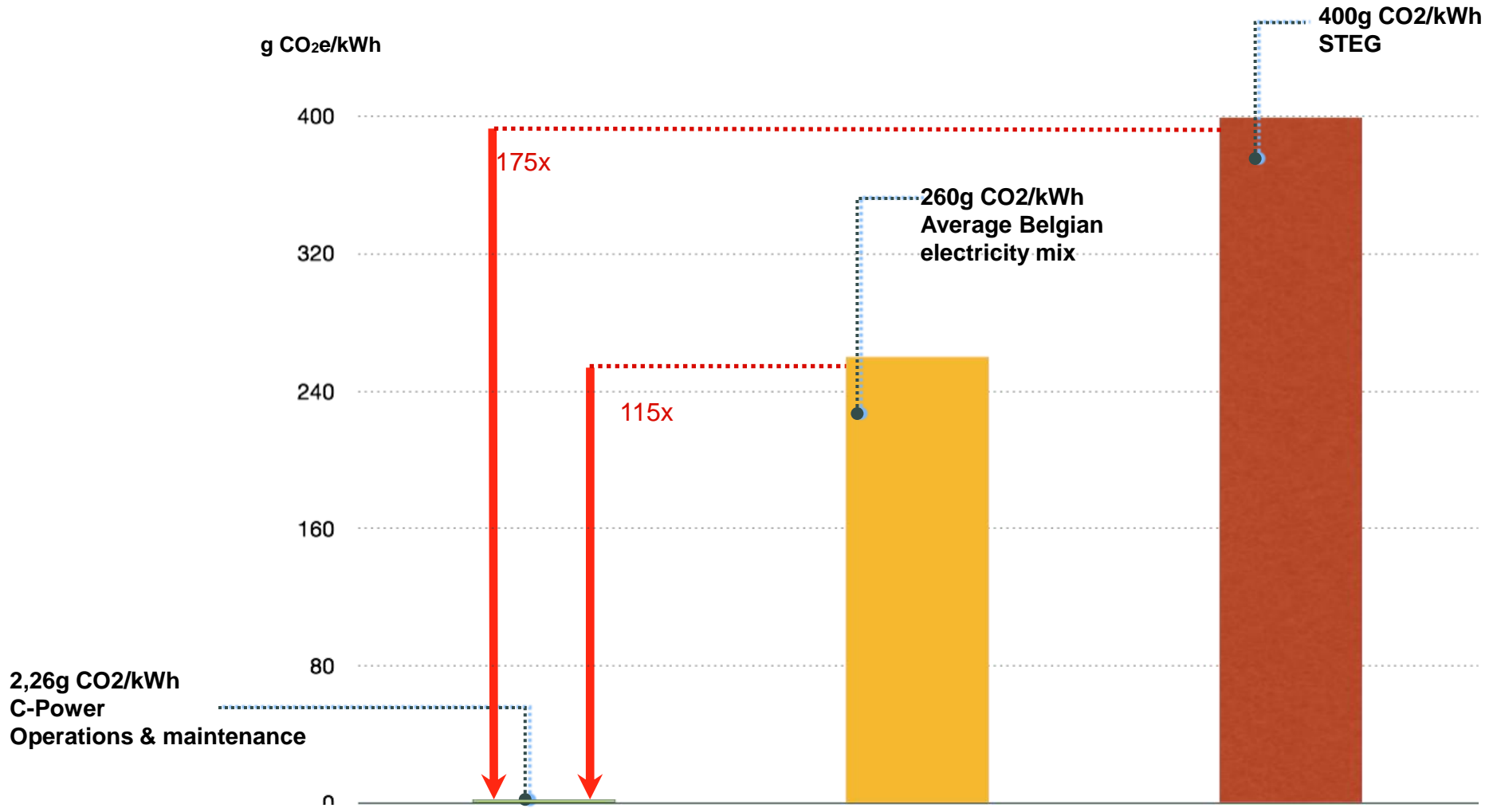
Carbon emissions

Already paid back by Christmas 2013

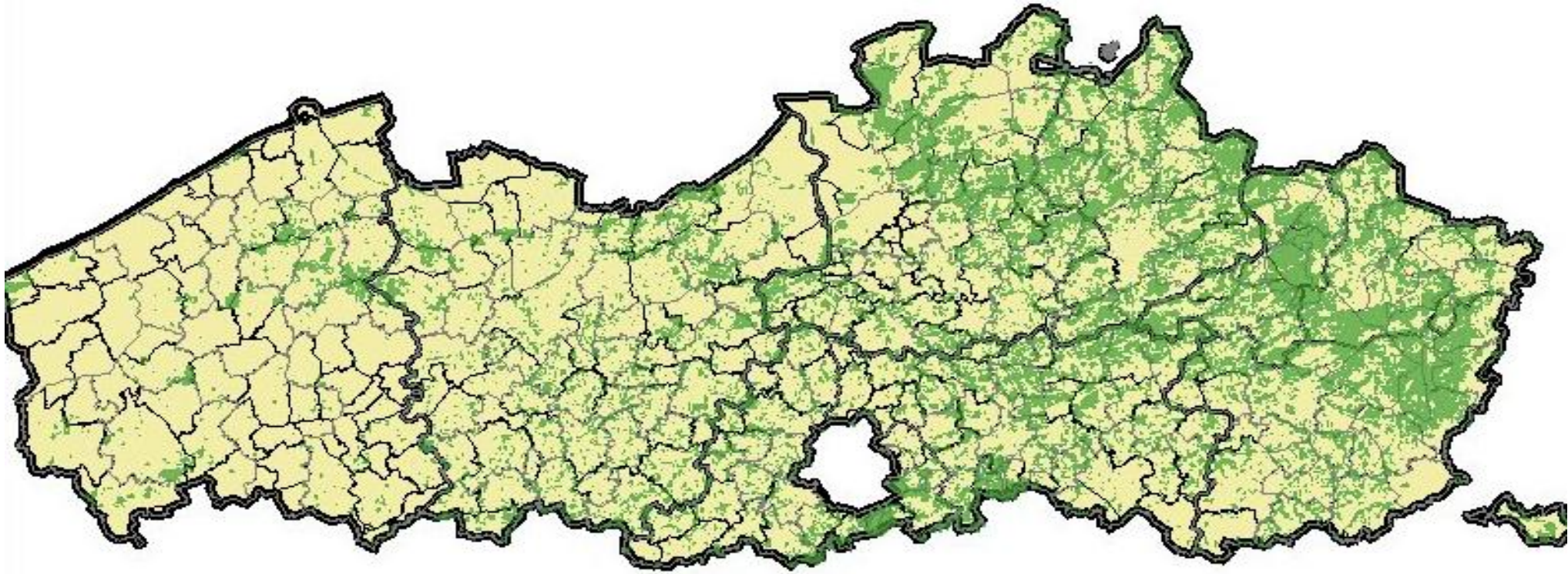


During 20 years of operations and maintenance

115 times less CO2 emission/kWh vs the Belgian electricity mix.
175 times less CO2 emission/kWh vs a new STEG unit



415.000 ton CO2 emission avoided every year (vs STEG unit)



= the yearly CO2 absorption capacity of **65.000ha forests**,
= the yearly absorption capacity of **one third** of the **forests in Flanders**

Micro-environmental impact

Marine environment (1)

- EIA (Environmental Impact Analysis):
 - Desk research: What are the expected impacts of offshore wind farms on the marine environment and are they acceptable?
 - Decisional basis for environmental permits => “go or no-go for new activities”
- C-Power 1: Wenduinebank (2002):
 - No environmental permit as negative EIA advice (noise)

Micro-environmental impact

Marine environment (2)

- Empirical check of EIA via environmental monitoring:
 - Compare expected impacts with *in situ* observed impacts via monitoring data, water samples, observation reports, etc...
 - Facts and figures to check and balance the environmental protection policy
- Monitoring done in several offshore windfarms:
 - Denmark: Horns Rev & Nysted (1999-2006)
 - Germany: Alpha Ventus (2007-2012)
 - Belgium: C-Power & Belwind (2007-2013)
 - Netherlands: OWEZ (2007-2011), Prinses Amalia (2008-2012)
- All environmental monitoring independently converging towards consensus that no negative impact on the marine environment is observed, even slighty positive impact!
- 30/10/2013: Alpha Ventus. BHS (German Federal maritime agency) president Monika Breuch-Moritz said: "We are pleased that there has been here no negative impact on the marine environment."

Environmental monitoring wind farms

What's next?

- Offshore wind farms: most environmentally friendly maritime activity with a net positive environmental impact
- BUT the activity is very heavily charged with the cost for environmental monitoring



“Polluter Pays” principle

- From monitoring to more pro-active and global marine environment improvement programs?