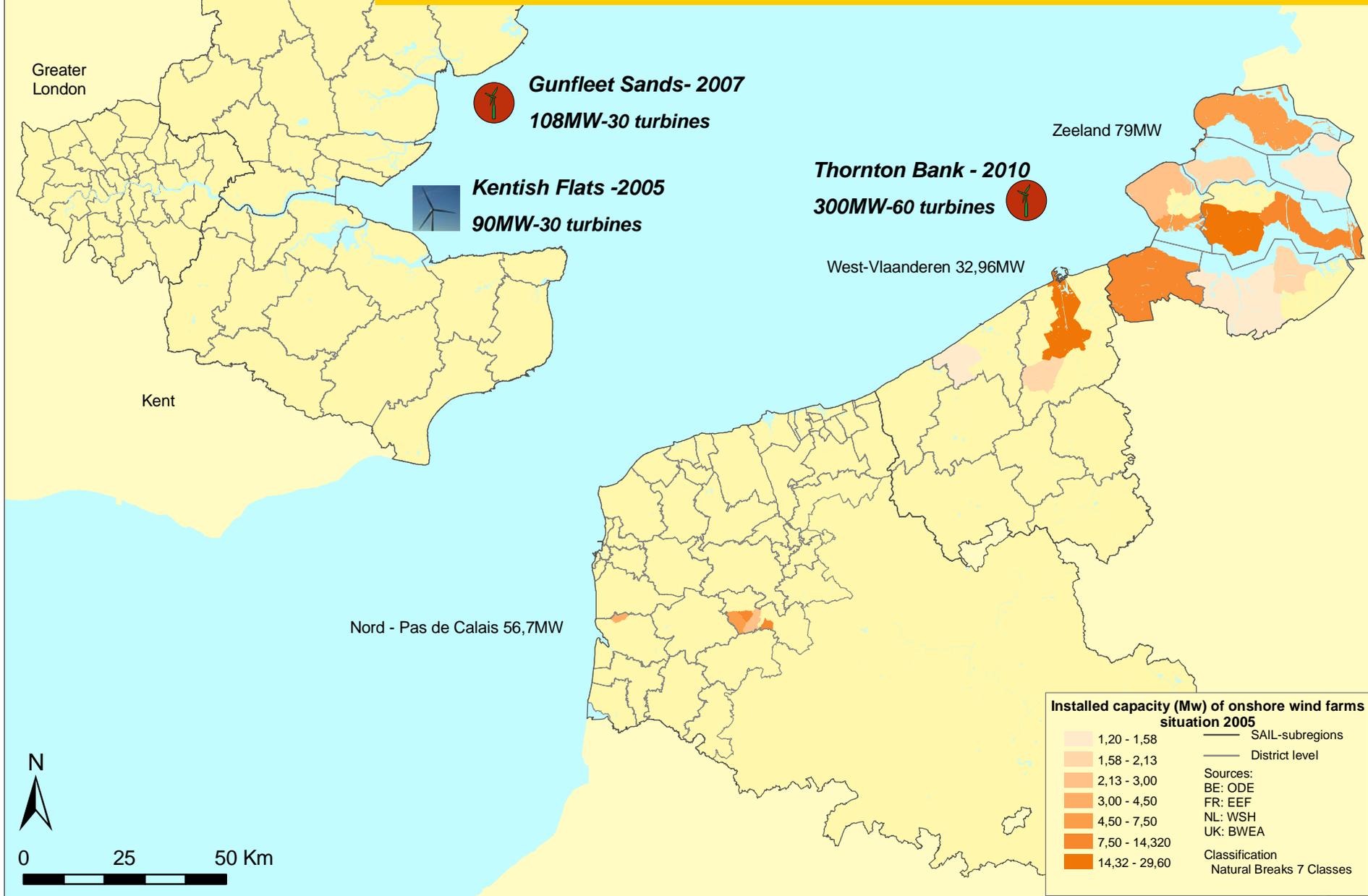


Indicator 23 Renewable energy from coastal resources



Offshore windfarms in production (2005)



Offshore windfarms under construction

- *Installed capacity (Mw) from offshore wind farms*
- *Installed capacity (Mw) from onshore wind farms*
- *Installed capacity (Mw) from wave and tidal energy*

Key Message

- The Southern North Sea is a longstanding site of energy production being home to six nuclear power stations and numerous oil-, gas-, and coal-fired plants.
- The region is now a focus for the development of renewable sources of energy utilising wind, tidal and wave power.
- By 2010, roughly 2,000MW of installed capacity for generation of electricity by offshore windfarms will have been added to the 140 MW generated onshore in Zeeland, West-Vlaanderen and Nord-Pas de Calais (2005).

Why monitor the renewable energy from coastal resources?

Energy production from renewable sources is generally considered environmentally benign. Increasing the share of renewable energy production is an important step towards achieving a sustainable supply for increasing energy demands. The shift in production from conventional to renewable energy is in part triggered by climate change, as a consequence of global warming through carbon release. It is particularly significant for the Southern North Sea because of the vulnerability of the region to storm surges and rising sea levels. Many countries have therefore set targets as shares of the total energy production to be provided by renewable sources. Wind energy is contributing increasingly towards meeting these ambitious targets. Because coastal regions provide excellent conditions and opportunities for alternative energy production, these activities have to be stimulated and carefully monitored. Installed capacity does not measure the amount of energy (Mwh) actually produced by the installation, but it provides a good measure of the private and public investments, political interest and the relative importance of the coastal zone for eolic and other alternative energy sources.

Where do the data come from?

In Europe, EUROSTAT is responsible for collecting general data on renewable energy from Member States. However, these data do not specify location and capacities of individual stations. Most SAIL countries have private or governmental organizations or producers associations that gather more detailed information. Most of them provide information on wind energy installations and capacities. Main data suppliers include Organisatie Duurzame Energie (ODE) in Belgium, Espace Eolien in France, Wind Service Holland (WSH) in The Netherlands, and the British Wind Energy Association (BWEA).

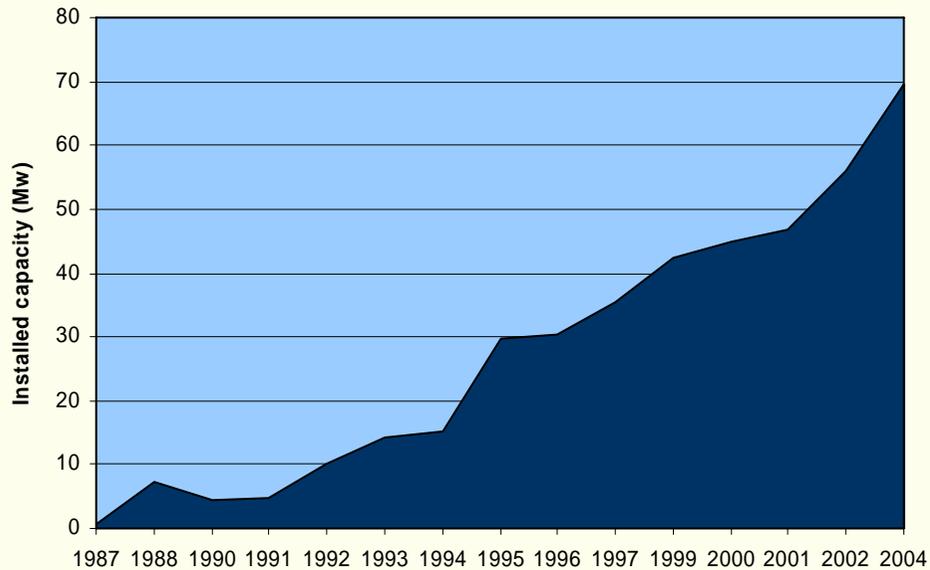
What does the indicator show?

From virtually nothing in 1987 (Zeeland), 1995 (West-Vlaanderen) and 1999 (Nord-Pas de Calais), onshore wind energy capacity in all three sub-regions has increased to 79MW, 33MW and 57MW respectively (2005). More recently, attention has turned to offshore generation. Kentish Flats windfarm began production in late 2005, with the capacity to generate enough electricity annually for 100,000 households. It will be joined in 2007 by Gunfleet Sands off the Essex Coast with a capacity of 108MW and in Belgium in 2010 by Thorntonbank with 300MW and Bligh Bank with 330MW. Licenses have been granted in the UK for a further 300MW installed capacity off Thanet, 500MW at Gabbard sands, and 1000MW at the London Array site which is expected to come onstream by 2011.



Master plant of all wind utilizing machines (Hütter, 1957)

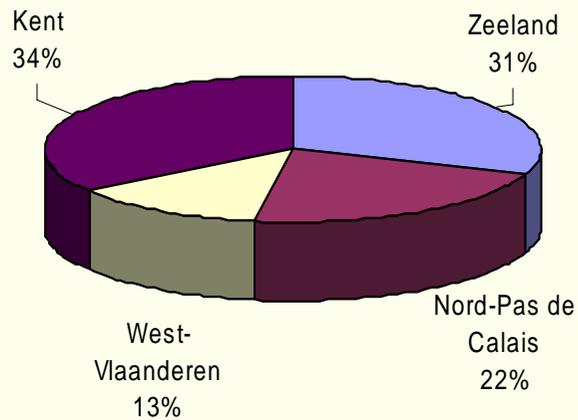
Capacity (MW) of onshore wind energy production in Zeeland



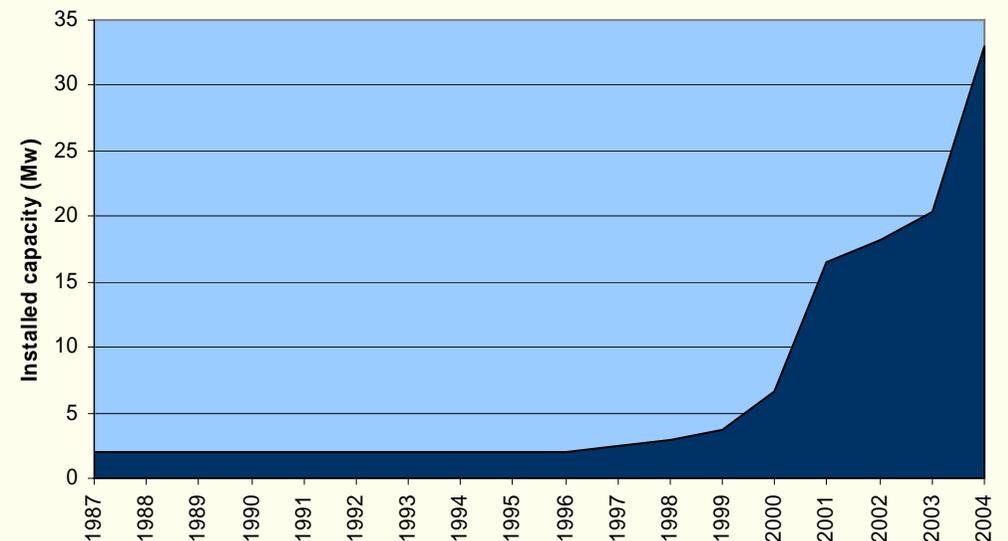
Renewable electricity 2010 targets - percent of gross electricity consumption from renewable sources

EU (25 countries)	21.0%
EU (15 countries)	22.1%
Belgium	6.0 %
France	21.0%
The Netherlands	9.0%
United Kingdom	10.0%

Shares of onshore and offshore wind energy (installed capacity) in SAIL sub-regions 2005



Capacity (MW) of onshore wind energy production in West-Vlaanderen



What are the implications for planning and managing the coast?

Renewable energy is generally considered environmental benign with very low net emissions of CO₂ per unit of electricity produced. This is especially true for energy production from renewable coastal resources. Coastal areas provide excellent opportunities for harvesting clean energy from wind, tides and waves. Not surprisingly, energy production from renewable coastal sources is considered an important step towards achieving sustainable energy supply for increasing demands. However, the exploitation of renewable energy sources has to compete with other coastal uses. They might also have negative impacts on tourism, land-and seascapes, habitats and ecosystems. Wind, wave and tidal turbines can have visual and noise impacts on the areas in which they are sited, affect wildlife and restrict access to sea or to the coast. Many impacts can be minimised through careful site selection. Planning of new installations has to be done considering other coastal functions so as to avoid conflict, preserve tourism, and protect biodiversity and natural values. A backlash against siting wind turbines on land will inevitably mean that developers will look more to offshore provision. As the sea becomes more crowded, there will be an increasing need to introduce a rigorous marine spatial planning system.

Methods and techniques for production of energy from tidal or wave energy are still in an experimental phase. Some technologies such as wind turbines are already well advanced with many improvements since they were first introduced (increased efficiency and capacity). Another obstacle for renewable energy consists in the access to the electricity grids. The EU directive on the promotion of electricity from renewable energy sources in the internal electricity market (2001/77/EC) addresses this issue requiring Member States to develop clear and transparent policies regarding charges to energy providers. The lack of a guaranteed market of access rights to the grid for smaller generators can restrict the more widespread uptake of renewable energy technologies.

To achieve a higher share of energy from renewable sources, targets have been set at a national and European level. The EU Directive (2001/77/EC) for example sets an indicative target of 22.1% of gross EU-15's (21% for EU-25) electricity consumption from renewable sources by 2010. It requires Member States to set and meet annual national indicative targets consistent with the Directive and national Kyoto Protocol commitments. Flanders in Belgium, is striving towards a 6% share of renewable energy from which 55% from wind (750MW). One third of it should come from offshore installations.



How reliable is the indicator?

Although information on renewable energy production, installed capacity and type of installation at the national level are reported to the EREC (European Renewable Energy Council), data for the regional and local situation are not so readily available or accessible. Relevant differences were found between datasets reported by differing sources. Since reporting generally focuses on a description of the current situation, it is more difficult to construct time series for a particular sub-region.

Link to European Renewable Energy Council:

<http://www.erec-renewables.org/sources/wind.htm>

http://www.ewea.org/06projects_events/proj_WEfacts.htm: "Wind Energy - The Facts"



