

# Public vs. Private Ownership of Offshore Wind Energy Facilities



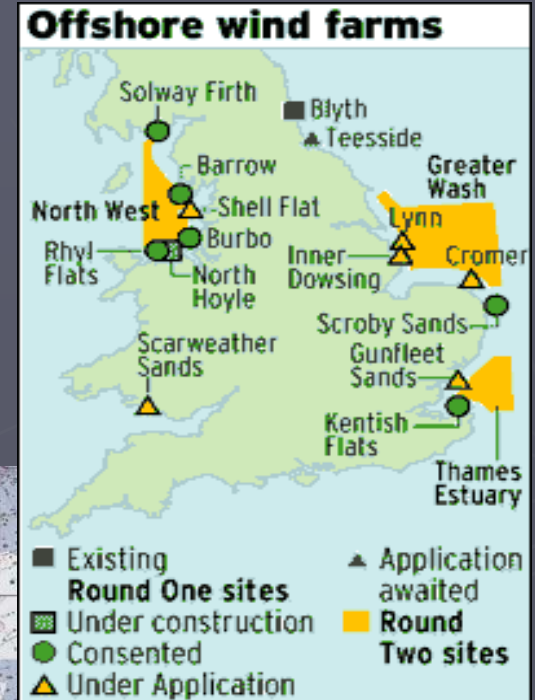
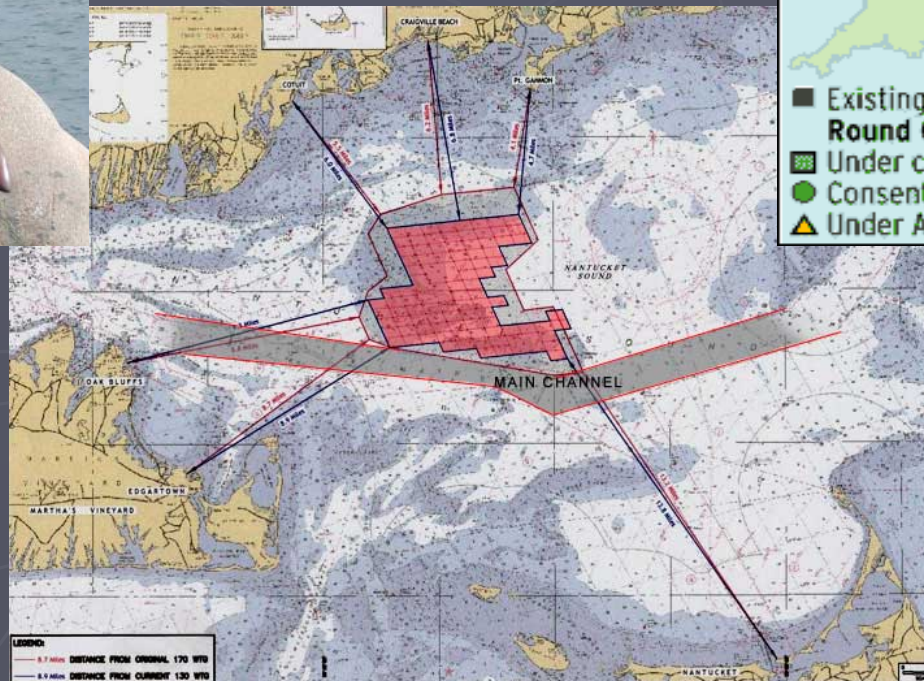
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United States Senate, Committee on Commerce, Science, and Transportation

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# Offshore Wind Development



# Concepts of "ownership"

## ▶ Corporate

- Cape Wind (USA, proposed)

## ▶ Municipal

- Hull, MA (USA, proposed)

## ▶ Government Encouragement

- United Kingdom, United States

## ▶ Cooperative / Shareholders

- Middelgrunden (Denmark, Germany)

# Denmark

- ▶ Among world leaders in offshore wind production and wind technology R & D
- ▶ Government assistance programs include:
  - Guaranteed payments
  - Government specified siting
  - Cooperative ownership of wind facilities, including some on a commercial scale

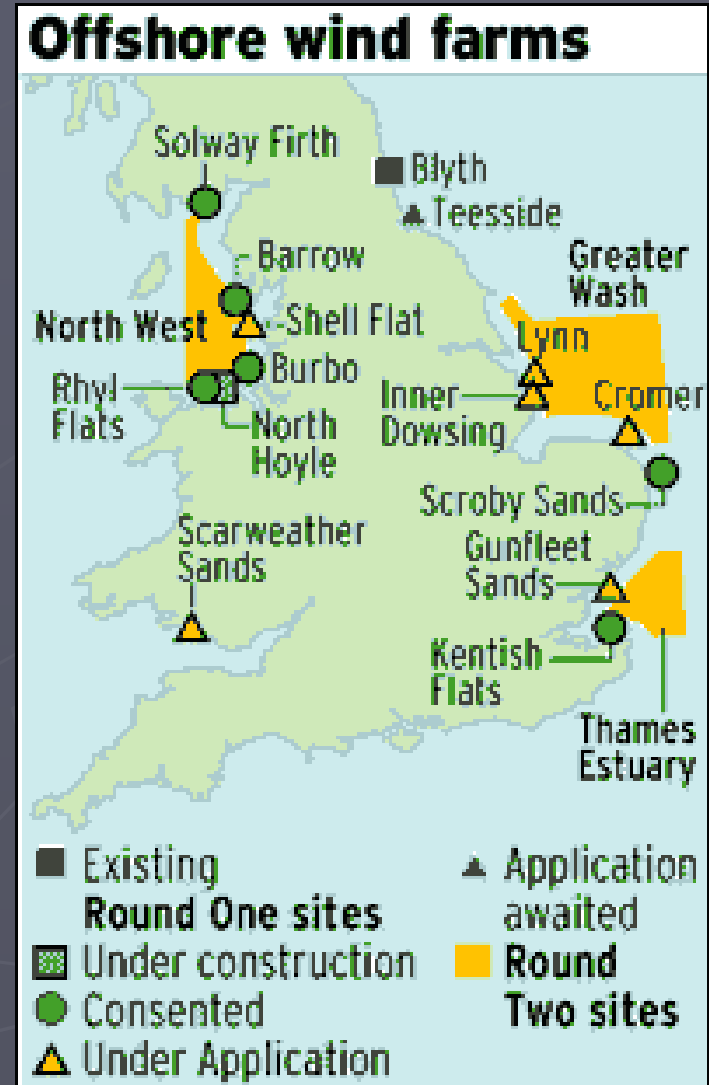
# Middelgrunden Offshore Wind Farm

Cost per share	€567
Annual net income	€71.05
Simple payback time	8 years
Annual income (after depreciation)	€28.47
Rate of return (after depreciation)	7.5%



# The United Kingdom

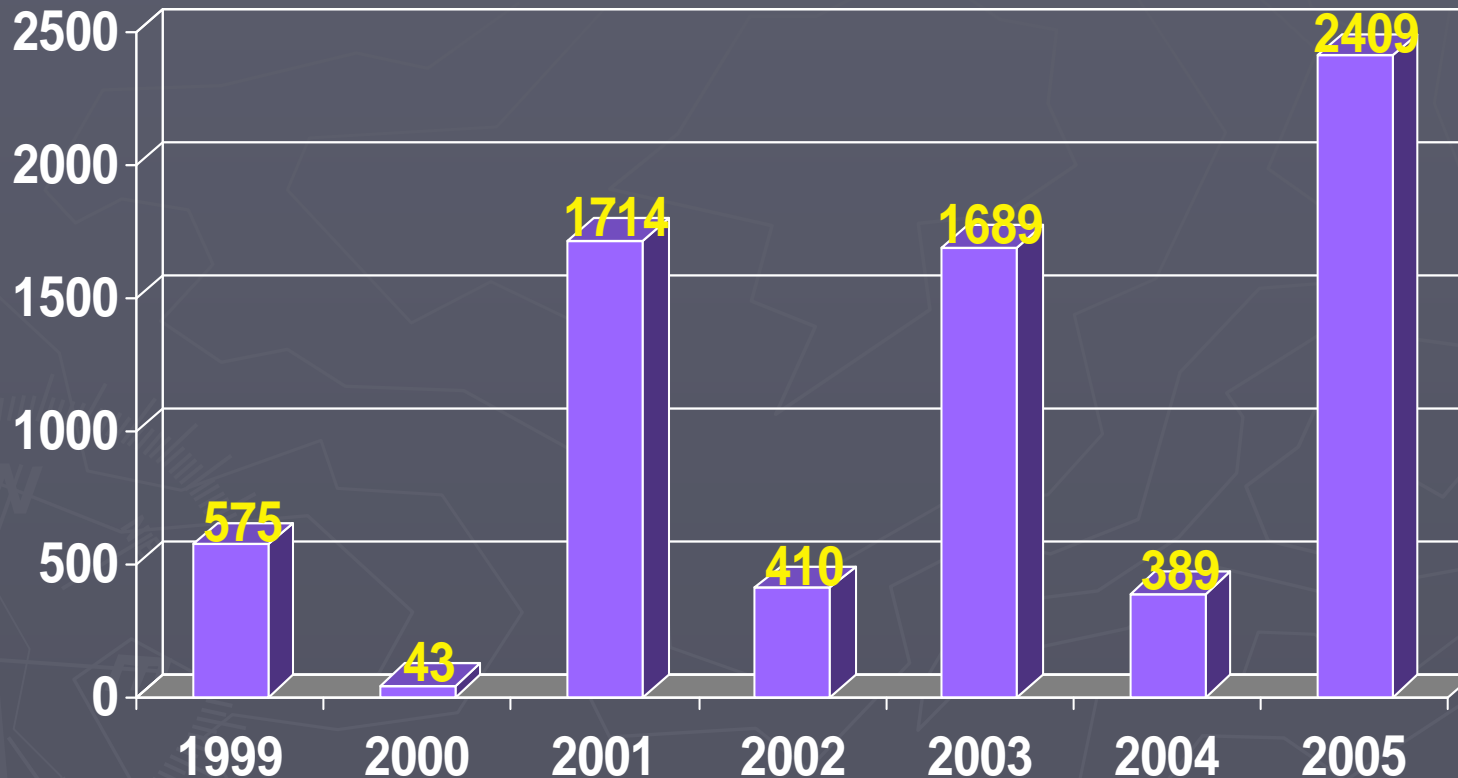
Offshore wind sites in the United Kingdom



# The United States

- ▶ MMS currently formulating regulations to manage offshore wind development
- ▶ No government specified siting
- ▶ Government assistance programs include
  - Renewable Portfolio Standards (state level only)
  - Production Tax Credit (sometimes)

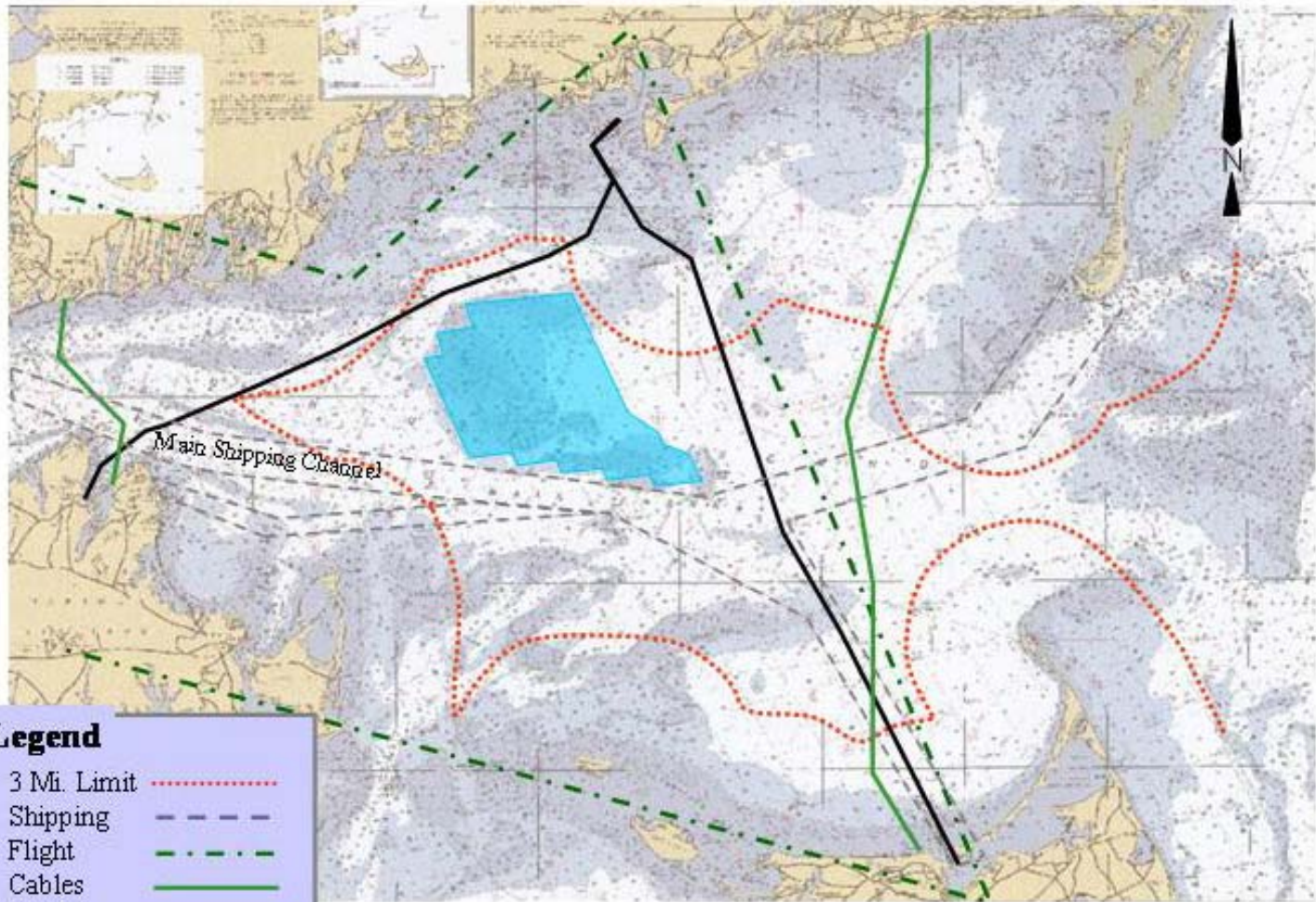
# U.S. Annual Wind Growth



Data courtesy of American Wind Energy Association

Installed Capacity in Megawatts.

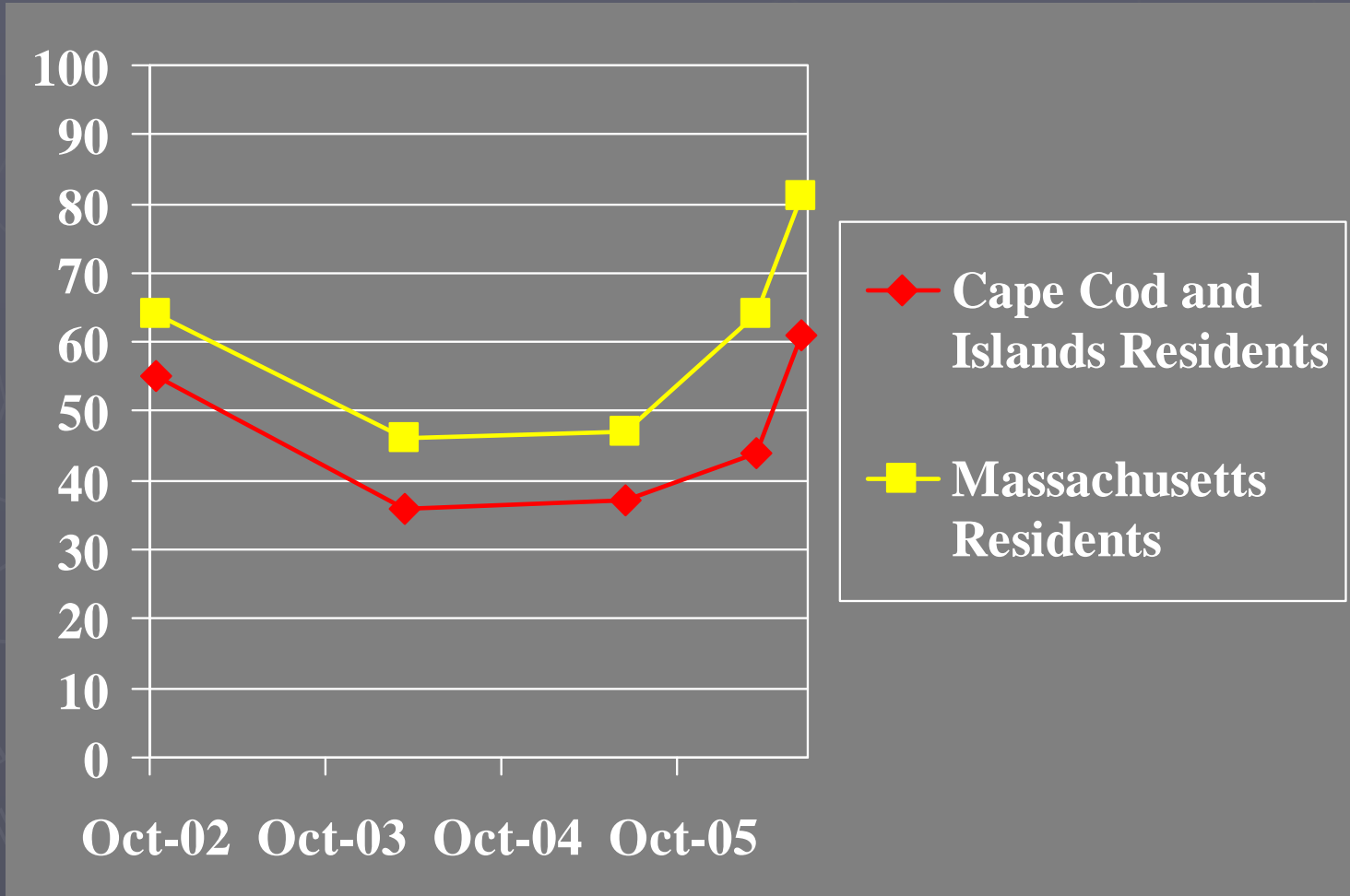
# Cape Wind



## Legend

- 3 Mi. Limit ..... (red dotted line)
- Shipping - - - - - (blue dashed line)
- Flight - . - . - . (green dash-dot line)
- Cables ————— (green solid line)
- Ferries ————— (thick black solid line)

# % of local residents who favor the Cape Wind proposal



# Hull, MA



Hull Wind I, installed at "Windmill Point," 2001



Approximate proposed site of Hull's 2 offshore turbines

# GOAL: increase public acceptance



# Sources

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- ▶ Manwell, J.F., McGowan, J. G., Rogers, A., Ellis, A., Wright, S., 2003. "Wind Turbine Siting in an Urban Environment: The Hull, MA 660 KW Turbine," available at: <http://www.ceere.org/rerl/publications/published/2003/>
- ▶ Sorenson, H.C., Hansen, L. K., Larsen, J. H. M., 2002. "Middelgrunden 40 MW Offshore Wind Farm Denmark – Lessons Learned," available at: [http://www.emu-consult.dk/includes/middelgrunden\\_munich.pdf](http://www.emu-consult.dk/includes/middelgrunden_munich.pdf)

# The United Kingdom

- ▶ Greatly expanding its offshore wind program
  - Some of the best offshore wind resources in the world
- ▶ Government assistance programs include
  - Climate Change Levy
  - Renewables Obligation
  - Capital Grants Scheme
  - Government specified siting (Phases I & II)