Economic value of mussel farming for nutrient removal

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- Local scale; nitrogen reductions in Limfjorden in Denmark
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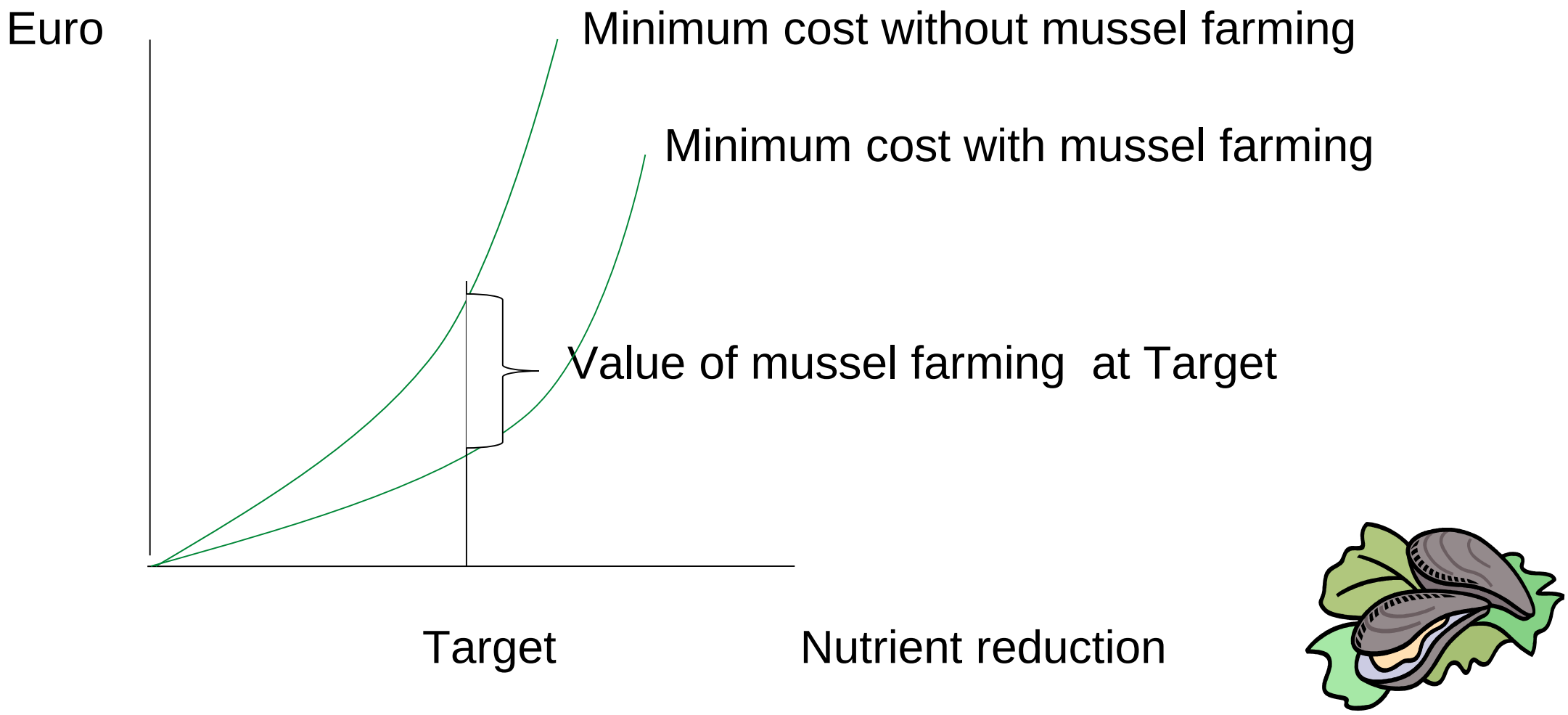
Principles for calculating value of mussel farming for nutrient removal

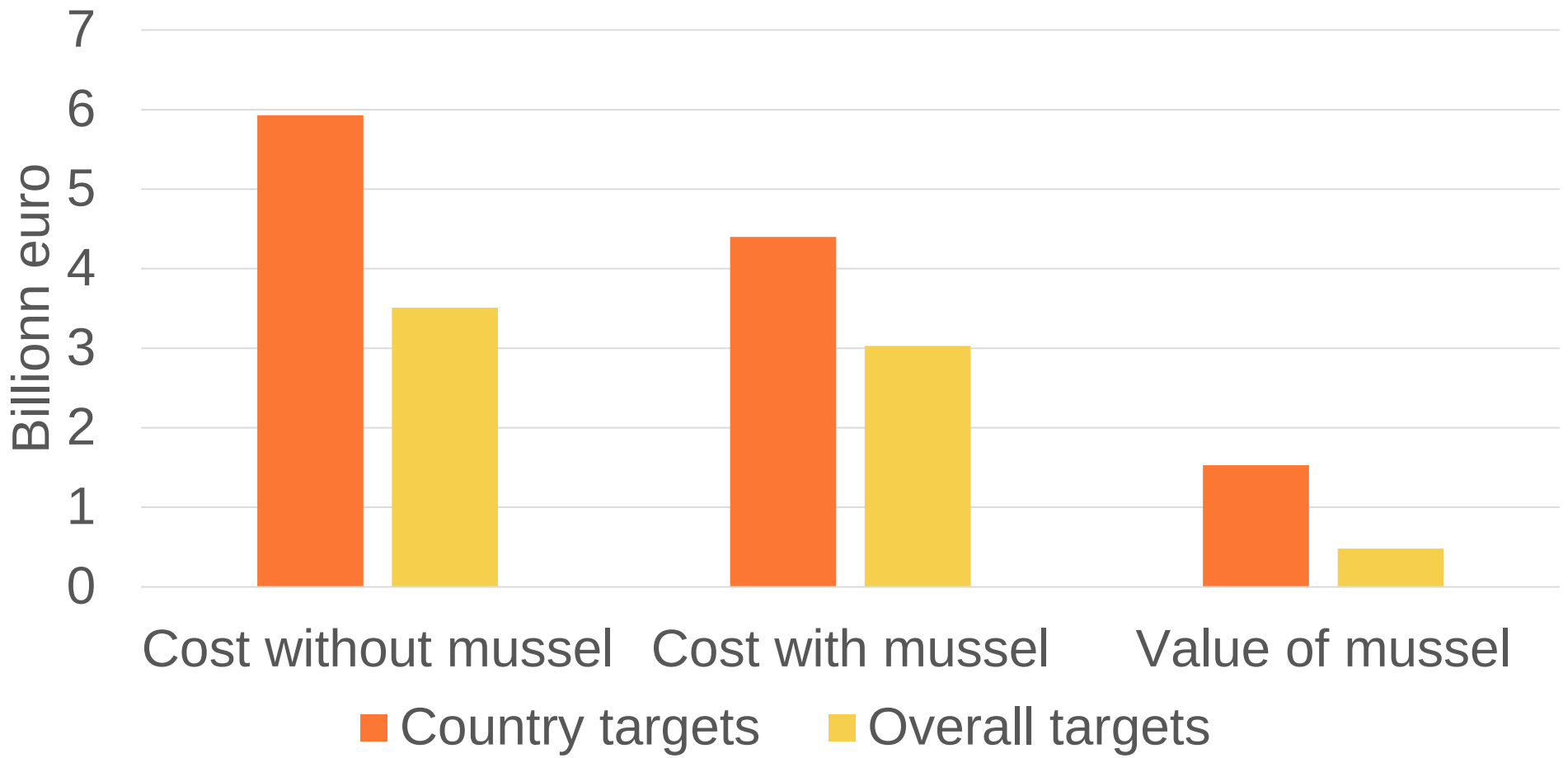


Value of mussel farming for BSAP

- **Costs and impacts on the Baltic Sea** from:
  - agriculture (livestock and fertilizers reductions, catch crops, increased grassland, construction of wetlands)
  - Improved cleaning at sewage treatment plants and industry
  - Reductions in air born nitrogen emissions

- **Targets**
  - BSAP country targets
  - Overall nitrogen and phosphorus reductions by 13 % and 48 %

Value of mussel farming in the BSAP under two target regimes, billion Euro



Local scale: nitrogen reductions in Limfjorden, Denmark, Euro/kg nitrogen removal

	Location 1 with long line	Location 2 with nets+pipe
Cost of mussel farming	12.64	6.4
Cost of land based measures	16.75	23.85
Value of mussel farming	4.11	17.45

Policies for mussel farming: principle issues

- *Payments for nutrient removals*, mussel farming as an offset:
  -gives incentives for technological development
  - stacking (i.e. payment for both N and P reductions)
  - additionality
  - uncertainty in predicting nutrient removal

- *Payment for costs of mussel farming;*
  - no incentives for technology development
  - simple to measure (but, risk of misreporting costs)

- *Transaction costs from implementation, monitoring and verification*

Values of mussel farming as offset among mussel farmers and land based measures under two target regimes, billion Euro

Policies for mussel farming: examples from practise

- Mussel farming as an offset for increased cleaning at sewage treatment in Lysekil at the Swedish West coast (2007-2010). 3900 ton biomass to compensate for 39 ton N load from the plant.

- Oyster as an offset for point sources in Virginia and Maryland with caps on emissions of N and P (2020 -)

Conclusions

- The potential economic value of mussel farming for nutrient removal is positive and can be high

- More focus needed on how to implement mussel farming (payment mode, additionality, stacking, monitoring and verification)