Cooperation mechanisms design, barriers and success factors exemplified by joint projects on off-shore wind

Klinge Jacobsen, Henrik; Hansen, Lise-Lotte Pade; Nielsen, Lise Skovsgaard

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Cooperation mechanisms design, barriers and success factors exemplified by joint projects on off-shore wind

Henrik Klinge Jacobsen, Lise-Lotte Pade Hansen & Lise Skovsgaard
DTU, Technical University of Denmark

IEE Project Res4less www.res4less.eu

Agenda

- Cooperation mechanisms
- Expected benefits
- Barriers and critical success factors
- Cooperation design
- Case study: Offshore wind

Cooperation mechanisms

- EU commission 20 percent renewables target in 2020
- Cooperation mechanism objectives?
  - Flexibility
  - Achieve the targets the most cost efficient way
    - implement the RES where cheapest
- Three types of mechanisms
  - Statistical transfer
  - Joint project
  - Joint support scheme

Cooperation mechanisms – joint project

• Gives MS with lack of sufficient low-cost RES potential (user country) the possibility to develop projects in another MS (host country)

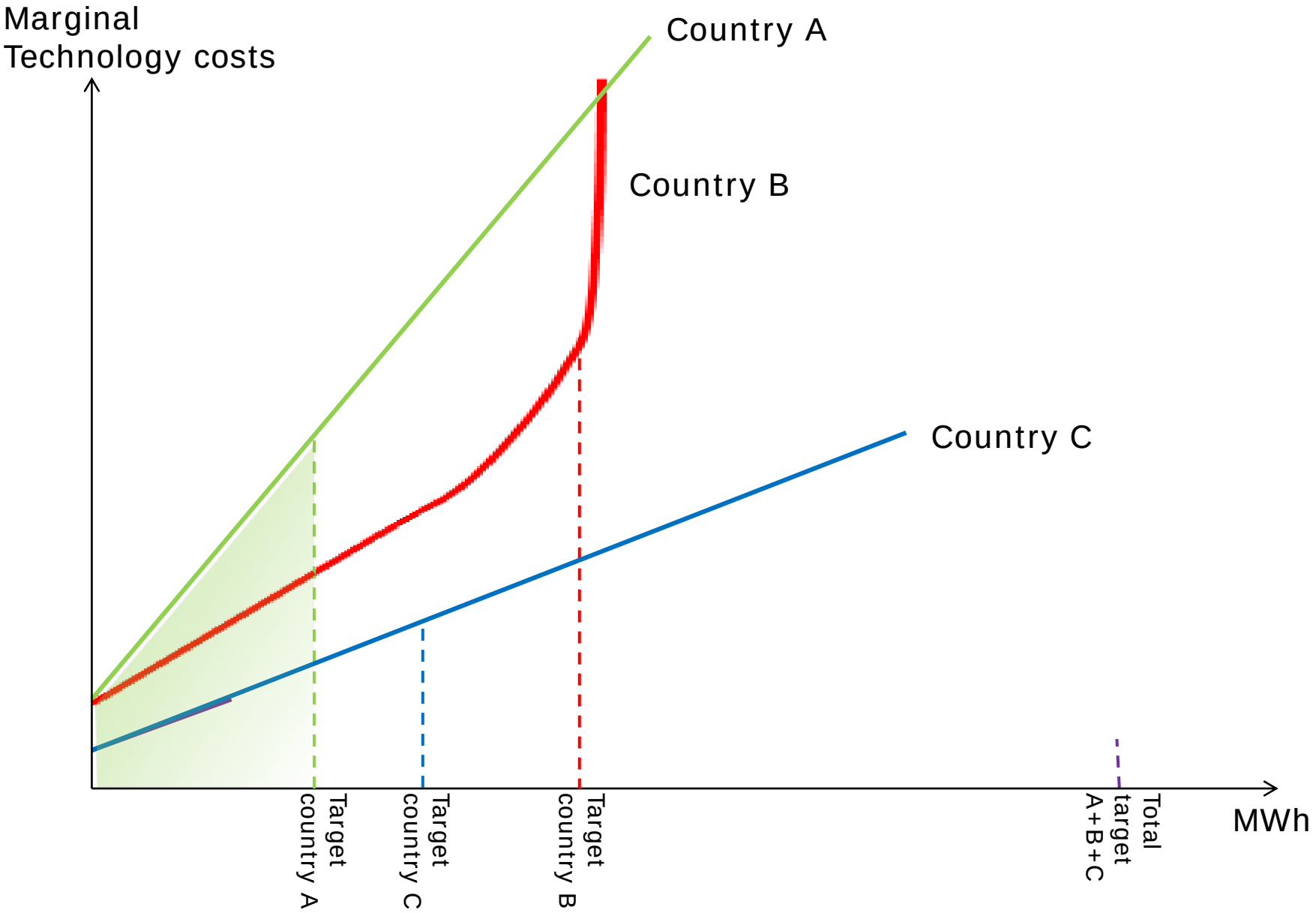
- Investors/developers supported
  - directly by user country
  - indirectly through host country
  - jointly by user and host countries
    - costs are balanced via a compensation scheme
- Project-to-project basis
- Special project support framework
  - technology/area specific standardised projects within agreed volume

Cooperation mechanisms – joint support scheme

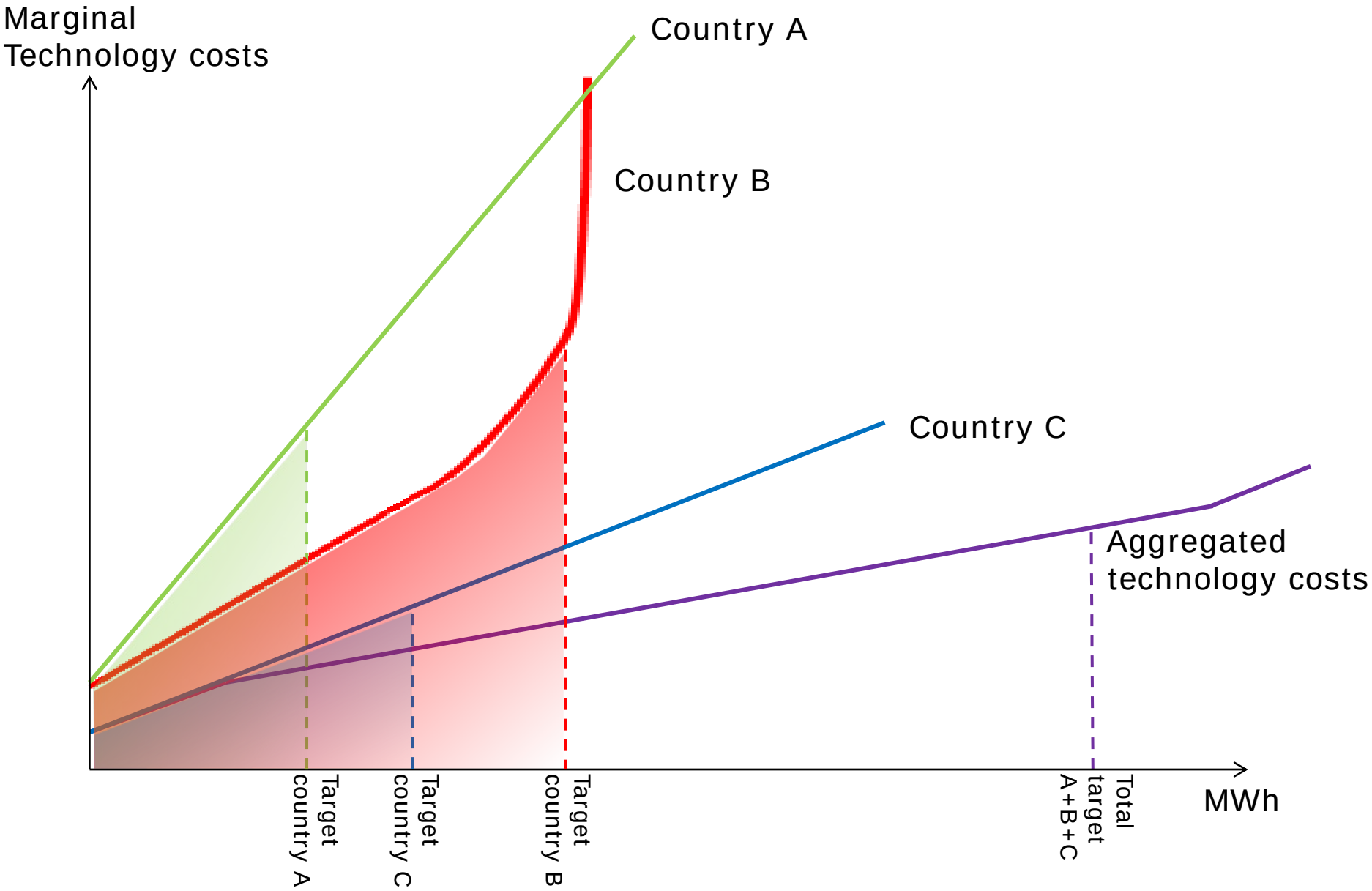
- Broad cooperation of MS on a national level
- MS agree on a common support scheme
- Greatest potential to efficiently utilise RES potential in the involved MS

- Less ambitious option: MS *partially* coordinate their national support schemes
  - technology specific
  - regional area (e.g. bordering offshore areas)

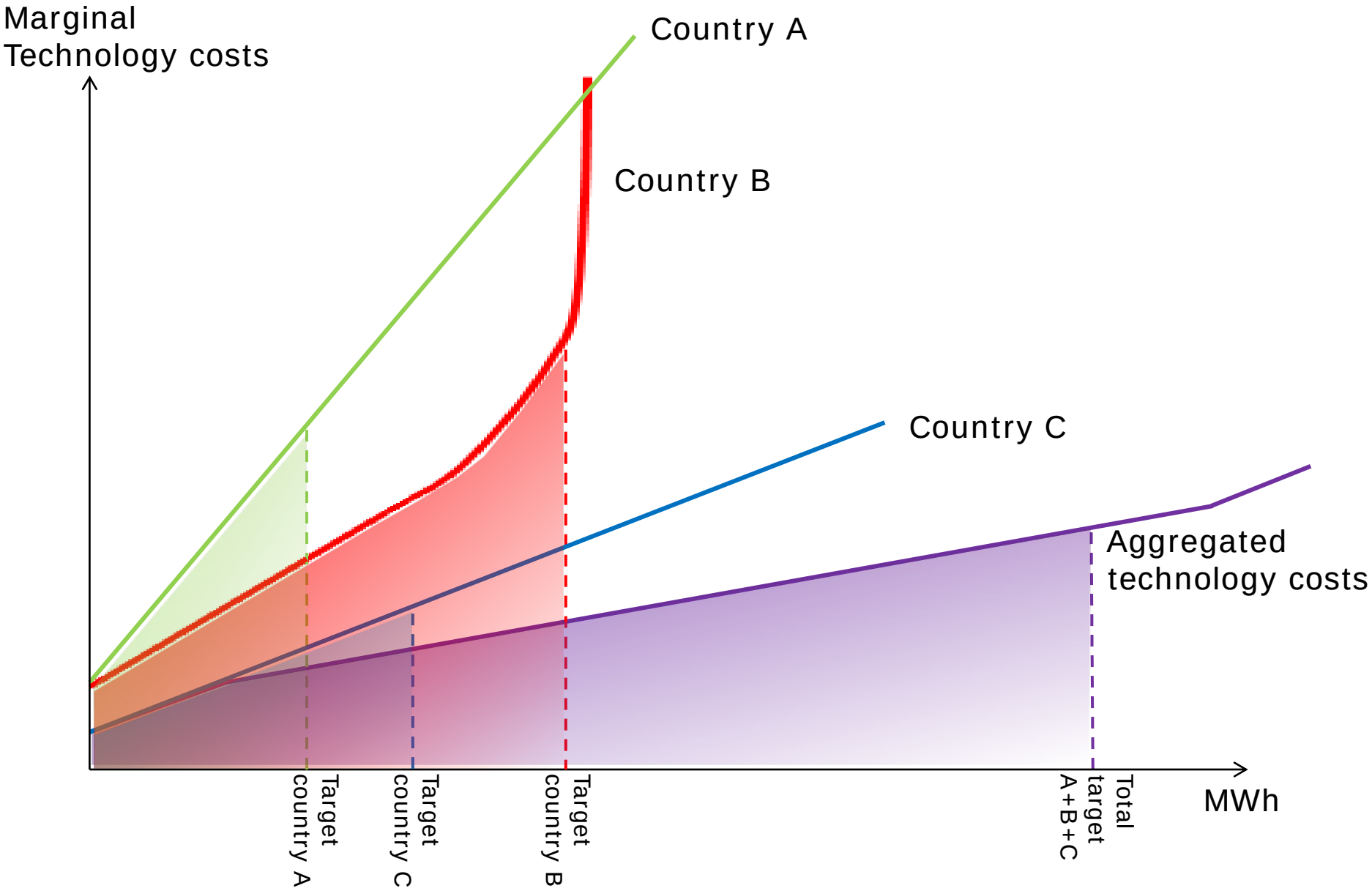
Benefits from cooperation mechanisms

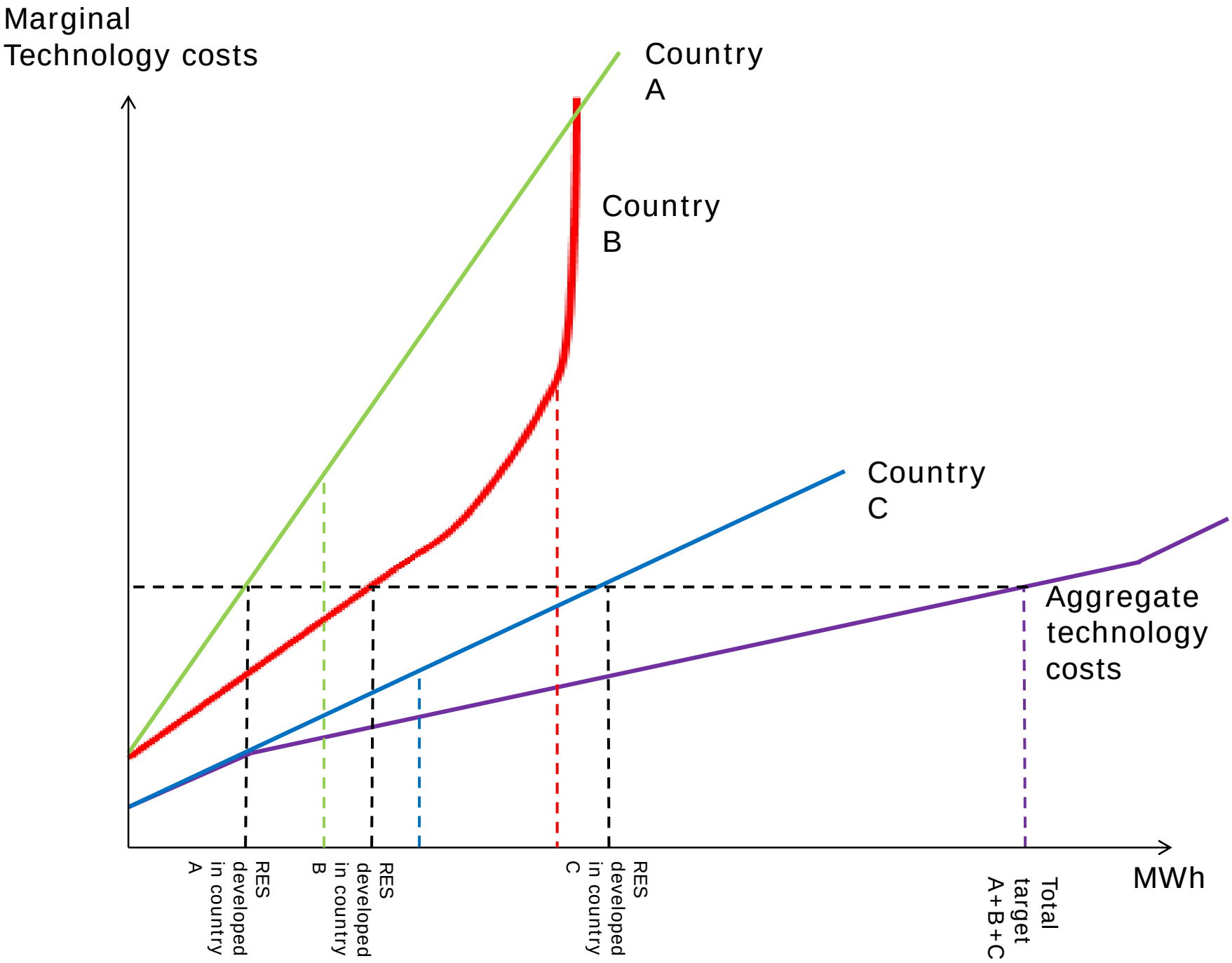


Benefits from cooperation mechanisms



Benefits from cooperation mechanisms




Marginal
Technology costs
Country
A
Country
B
Country
C
Aggregate
technology
costs
RES
developed
in country
A
RES
developed
in country
B
RES
developed
in country
C
Total
target
A+B+C
MWh

Barriers

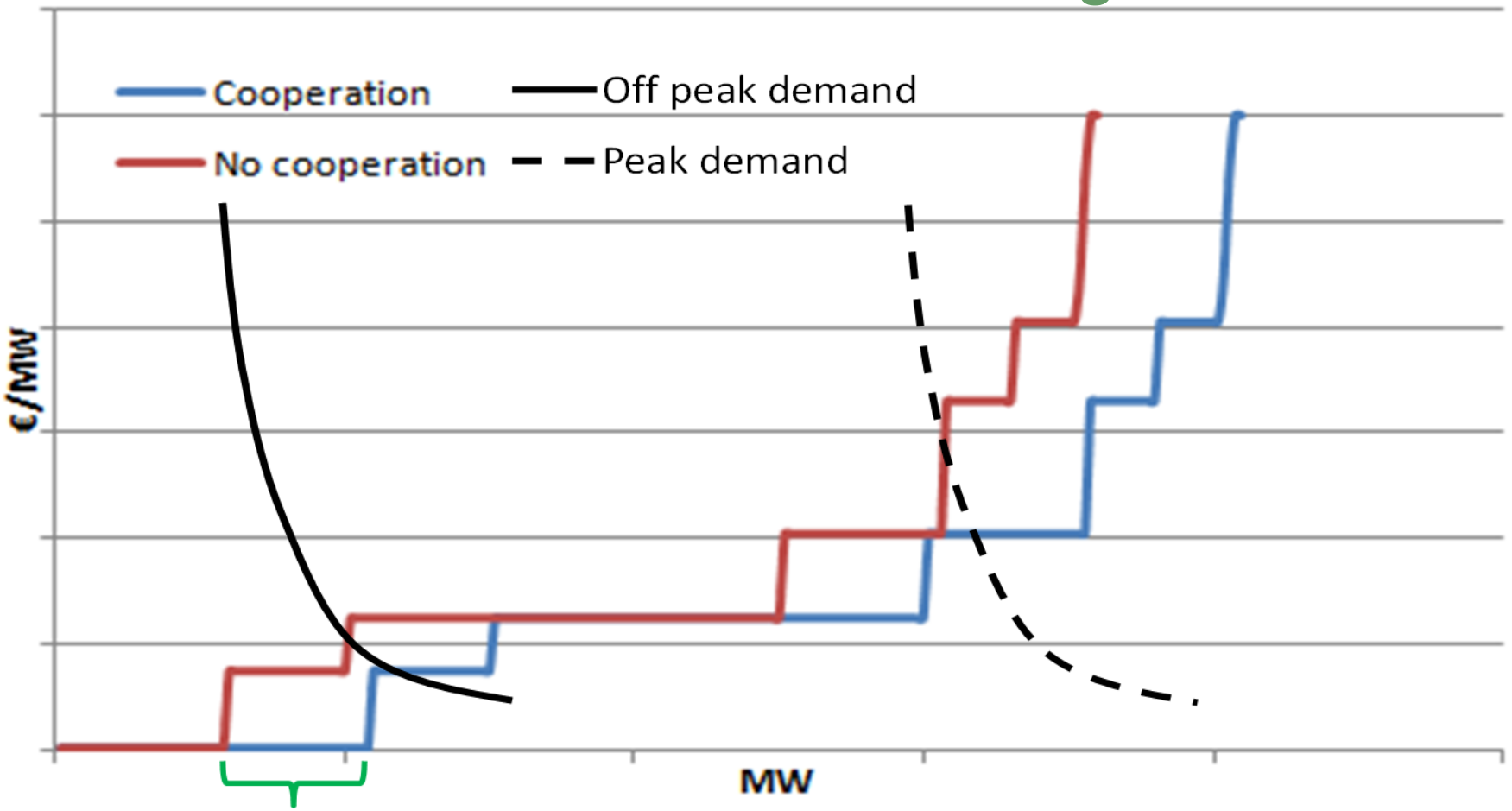
- Overall precondition for cooperation:
  - Both (all) MS should benefit
    - positive net-benefits are required

- Different political agendas (objectives) embedded in the support schemes
- Power market effects potentially significantly different
- Differences in network regulation
- Costs of non-compliance risk sharing
- Compensatory challenges
- Post 2020 targets not known

Barriers – power market effects

- Inflexibility of the energy system (long term investments)
- Changes in price level and volatility
    - Loss to existing producers
    - Lack of investment incentives for conventional
- Less diversified generation mix for large scale cooperation
    - More vulnerable system with more uncontrollable resources
- Critical success factors
    - Ability to agree on a compensation scheme
    - Certainty that power market effects small or positive for both

Power market effects and challenges



Barriers – Post 2020 target

- No targets for post 2020 specified
  - Potential user countries will focus on the 2020 RES contributions
  - Investments in renewable technologies with 15-25 years lifetime
    - costs from investments large compared to value of RES credits for a single year
      - extreme case: value of credits post 2020 = zero
  - Unwillingness of the host country to engage in cooperation involving their cheapest surplus resources.
- Critical success factor:
  - Settlement of post 2020 targets – at least minimum levels

Case study for joint project cooperation: Off-shore wind in the Danish North Sea

Joint project cooperation with tendering of off-shore wind farms

The host country (DK) specifies the tender conditions and negotiate with user country (NL) a transfer price for the RES credits in 2020. The total size of off-shore wind farms are **2GW** corresponding to **8200GWh** in 2020.

Can be implemented in phases down to 200MW wind farms without changing the cost parameters

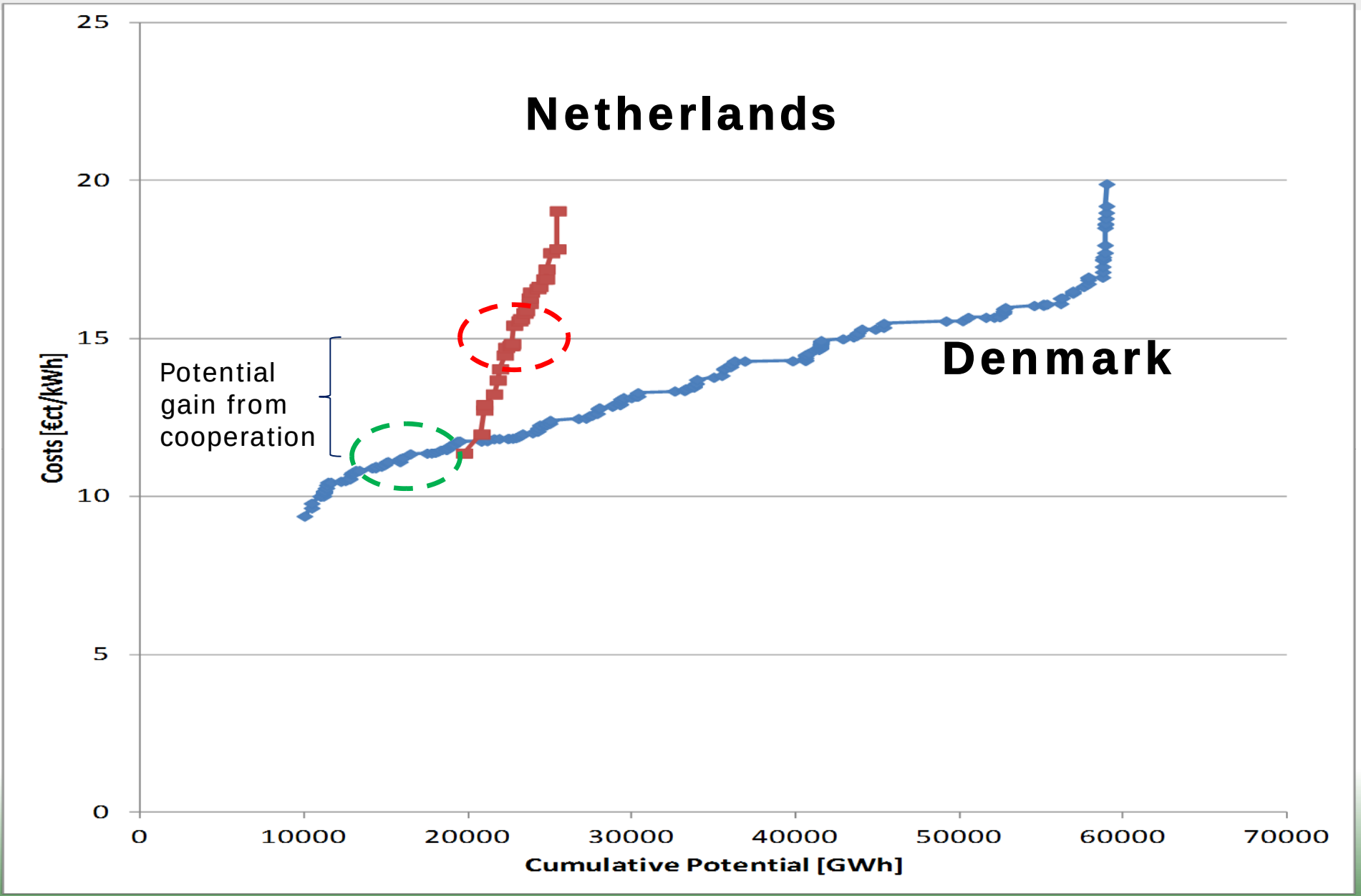
Why this case study?

Off shore wind energy in the North Sea is a very large potential for RES and potential cooperation benefits
Limiting factors are the availability of low cost shallow and close to shore locations without interfering activities

Denmark has a 2020 surplus of medium cost offshore wind potential that is available for cooperation:

- wind farms have good wind conditions
- relatively shallow area
- transmission grid can absorb generation
- planning is already there

Offshore wind costs 2020



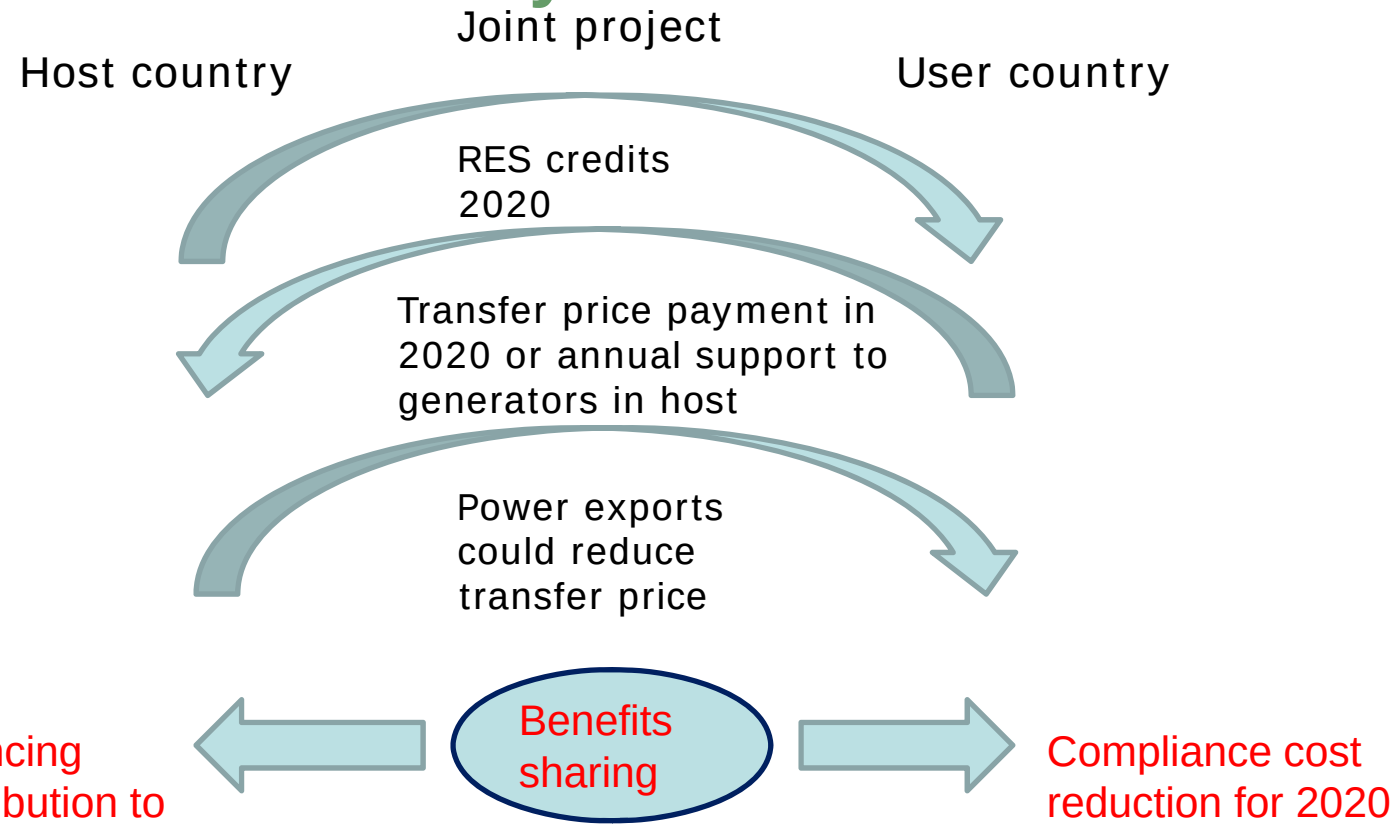
Joint project cooperation: Danish offshore wind of 2GW in the North Sea

2020 potential below 15 €ct/kWh is available in Denmark and planning in place

- Distance from shore: 20-25 km
- Depth: 20-25 m
- Windspeed: 10-11 m/s
- Close to support port (Esbjerg)

In the Horns Rev area and nearby there are considerable potentials for expanding capacity from the already existing 369 MW and the 400 MW addition decided

Transfer price and RES credits principles
Host and user country transfer of 2020 credits



Suggested design of the cooperation mechanism:

Cooperation include two options for the **Netherlands:**

I. Acquire the full RES capacity credits necessary for 2020 compliance but not the power generation: Cost example, support cost for 15 years: **80 Euro/MWh annually (total payment for 2020 credits = 1200 Euro/MWh)**

⇨ **Capacity counts towards NL post 2020 targets (low risk post 2020)**

II. Acquire only the credits necessary for 2020 compliance: Cost example, **350 Euro/MWh* in total payment for 2020 credits**

⇨ **High risk on post 2020 compliance**

*** Based on an assumption of a post 2020 credit value for DK of 50€/MWh**

Danish offshore wind of 2GW in the North Sea

Danish off-shore wind development is available for cooperation and joint projects with tendering is relatively simple to establish

Benefits in terms of compliance cost savings for Netherlands can be substantial **2.5 bill € - 9.4 bill € (accumulated over the support time) depending on design option and for the full scale cooperation**

Denmark will have more wind development and in option II have additional credits to comply with increased post 2020 RES targets or domestic RES targets

The results for both countries are extremely sensitive to the assumptions regarding the value of post 2020 credits (5c€/kWh) **EU post 2020 targets?**