Introduction to risk perception by market players

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Life is hazardous, investments even more so…..

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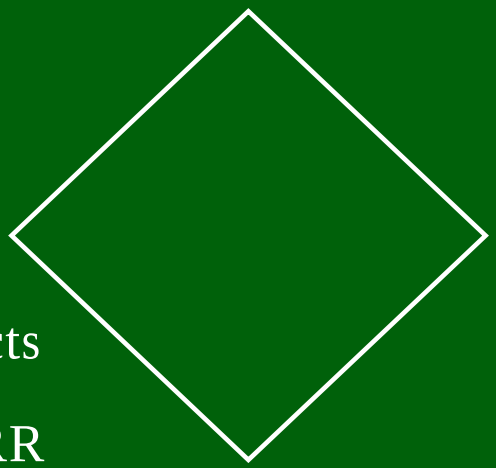
Why are risks important ?

- In real life nearly all developments are uncertain
- Simple financial analyses do not reflect this reality
- All sorts of uncertainties affect expected return on investment
- Level of certainty required before investment decision
  - not only for investors, but other parties as well
- Risks affect position of stakeholders regarding investments
  - for each party however in a different way

Risks affect position of 4 “players” on the market

main risk: failure to repay
mitigation: debt service coverage
long-term income guarantees
collateral

banks - project financers



project investor

main risk: failure to repay
mitigation: long-term contracts
fixed prices
demand higher IRR

electr. supplier

main risk: over payment
loss of supply
mitigation: flexible pricing
price discounts
short-term contracts

government

main risk: failure to meet overall targets
mitigation: financial support mechanisms
guarantees

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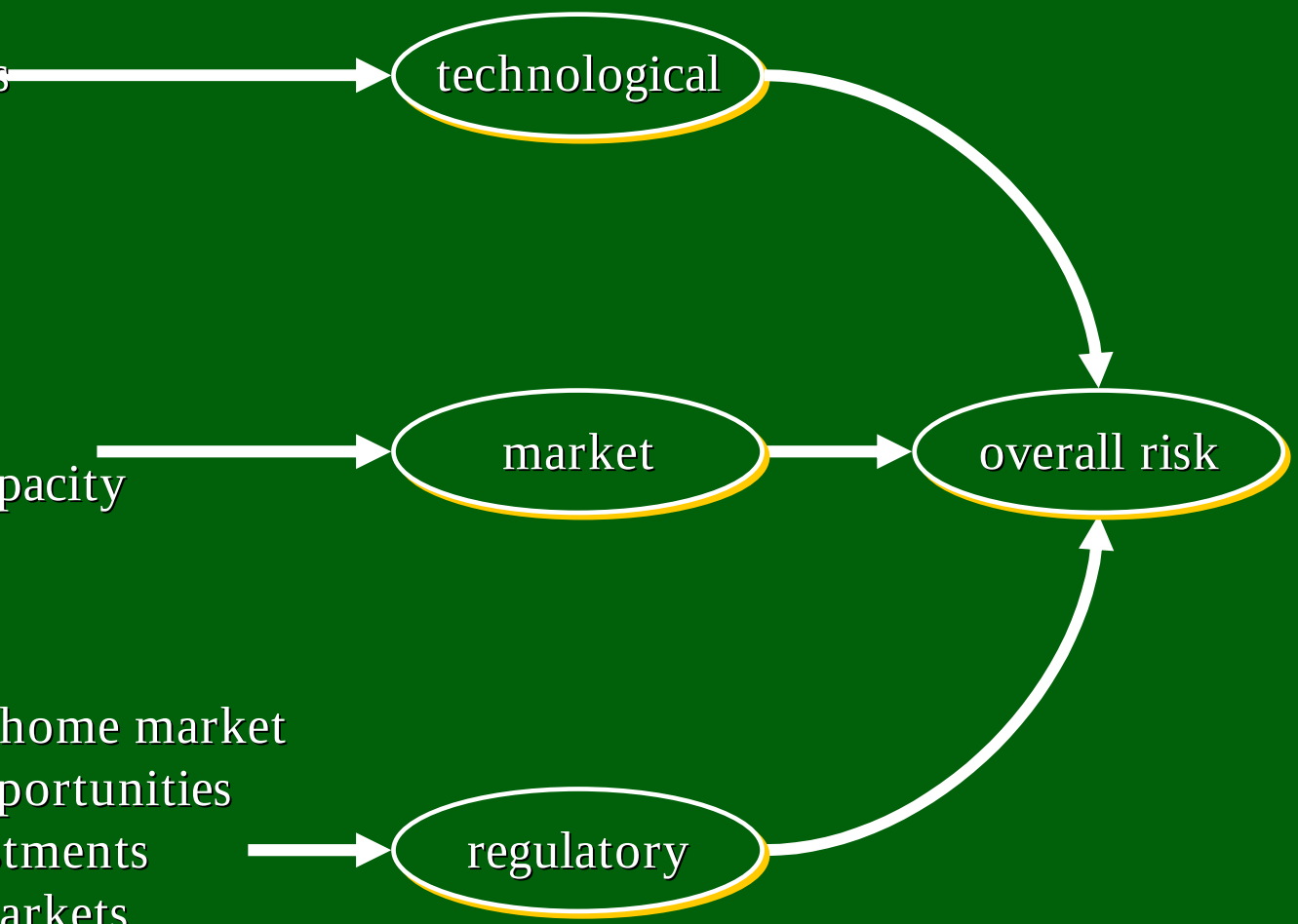
Projects have risks at three levels

- investment costs
- load hours
- maintenance costs
- efficiency
- etc.

- electricity price
- transport costs
- fuel price
- import/export capacity
- inflation
- etc.

- financial support home market
- import-export opportunities
- subsidies on investments
- support export markets
- etc.

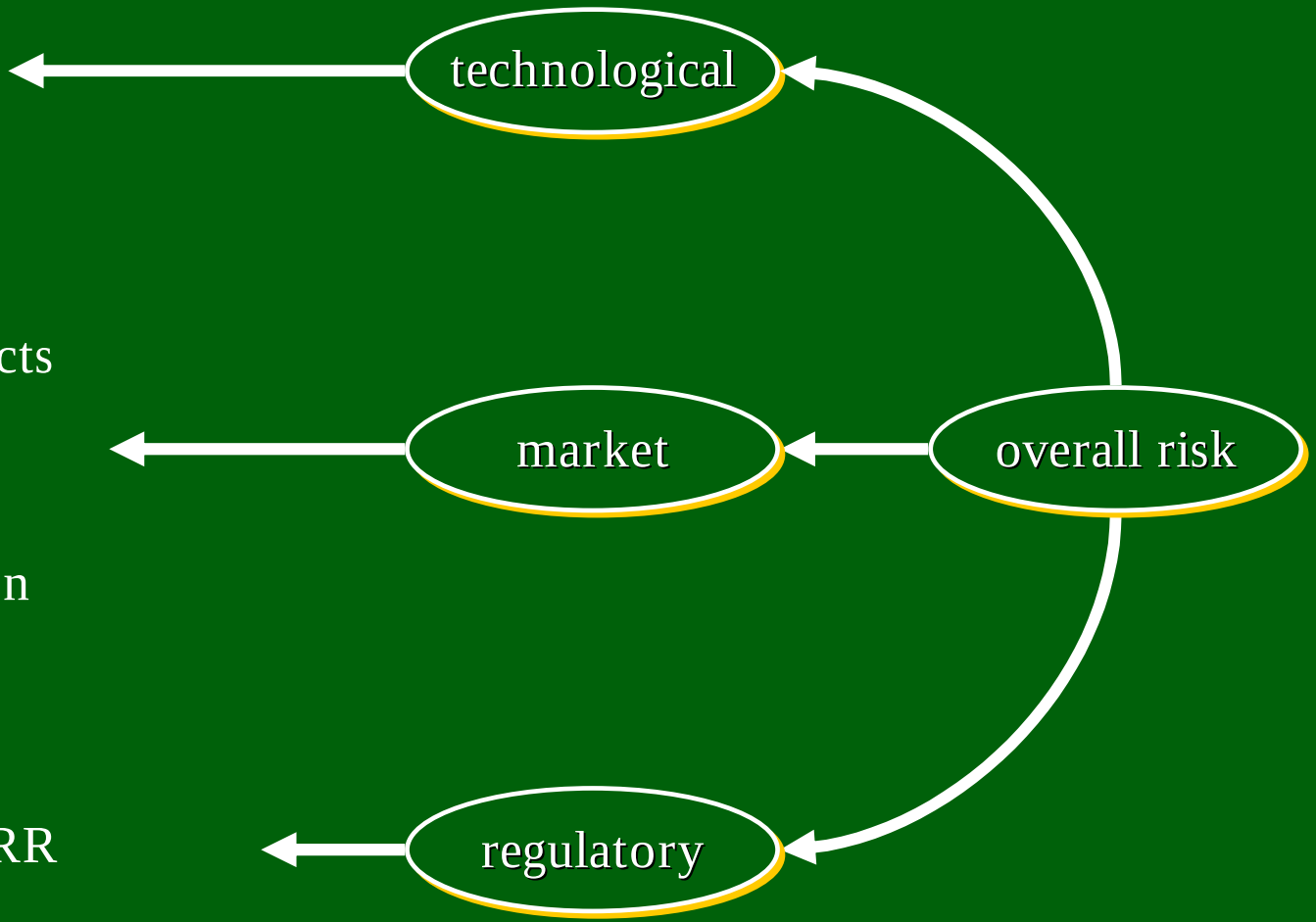


Risk mitigation by projects owners

- project selection
- vendor selection
- O&M strategy
- insurance
- guarantees

- long-term contracts
- hedging
- planning
- fall back options
- fuel diversification

- project selection
- demand higher IRR
- diversification.



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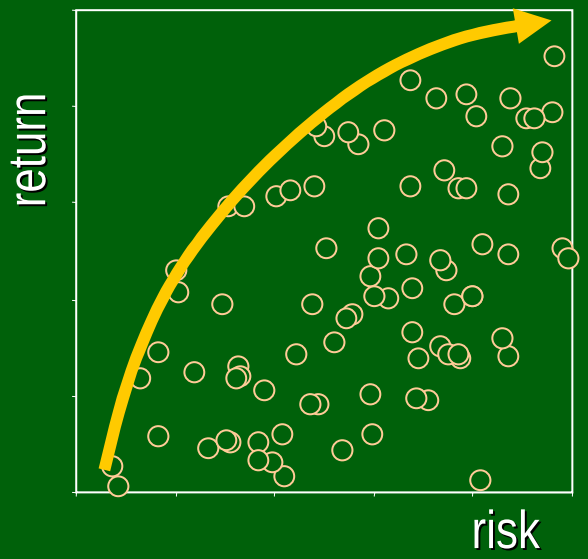
Relation risk - returns differs strongly with stock market

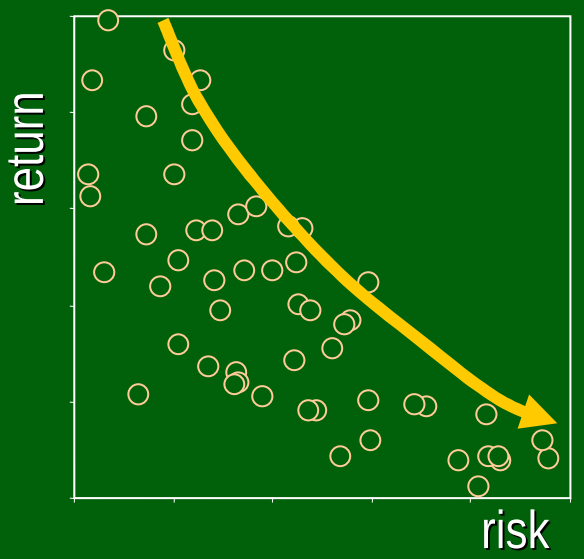
Stock market



- more risk increases chance of better returns
- trade-off between risk and returns
- diversification required to manage risks

- better returns created by large diversity in sectors, countries, companies, etc.
- for each risk level a best performer exists
- efficient investment frontier

Renewable projects



- more risk increases chance of less returns
- NO trade-off between risk and returns
- diversification required to manage risks

- larger risk created by limited diversity in technology, accumulation of (regulatory) risks while income is more or less fixed
- high returns provide best guarantee against ris

Example case : Creating a green portfolio

- Background situation:
  - Energy supplier who wants to sell green electricity
  - Examples exist in the Netherlands (possibly Sweden in the near future when system allows import)
- Options to consider
  - where to invest in Europe
  - how to maximise profit and lower risk
- Main sources of risks
  - Price level of “green” on the home market
  - Cost of transportation (import - export)
  - Cost price of generation

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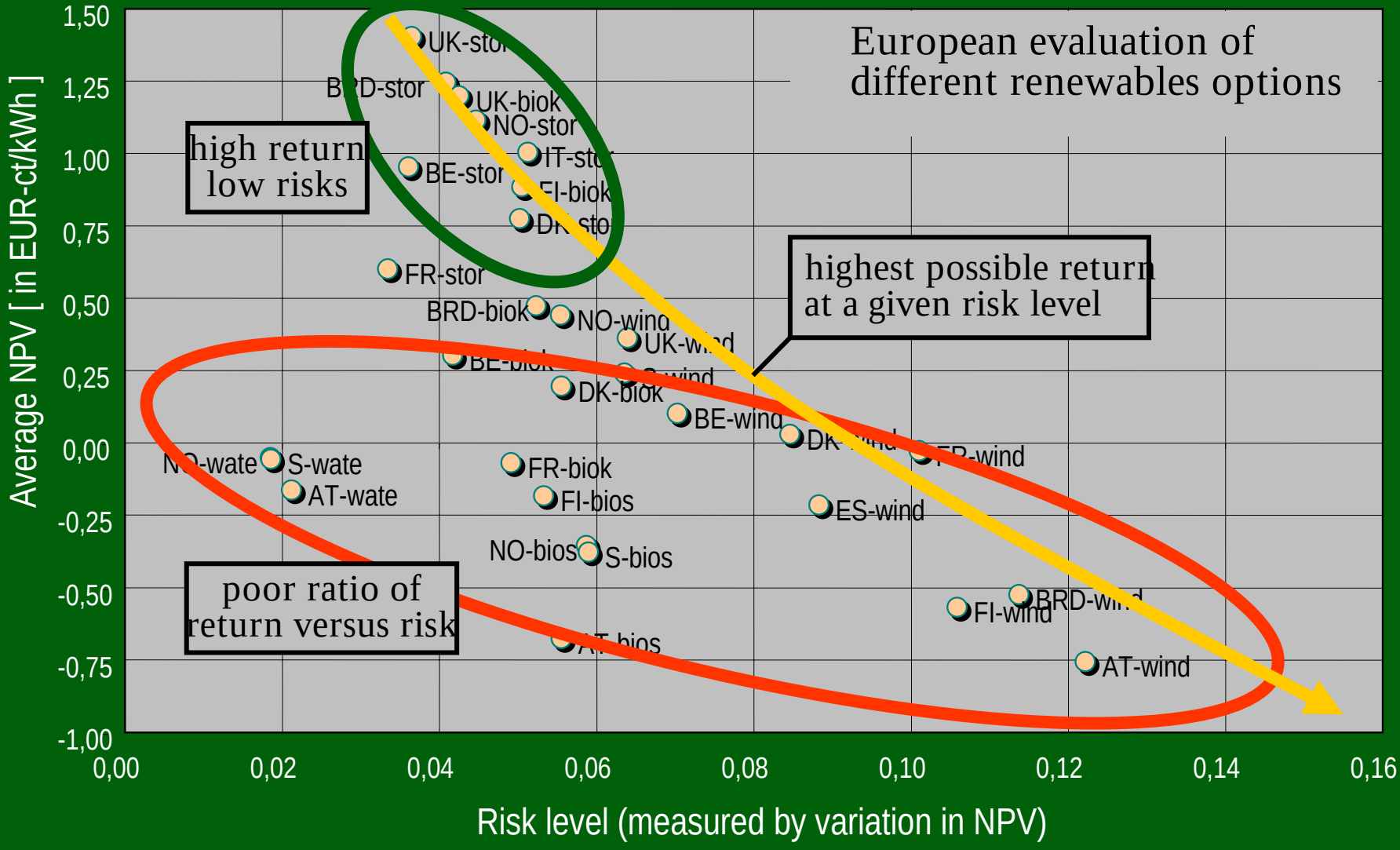
Returns decrease strongly with increasing risks



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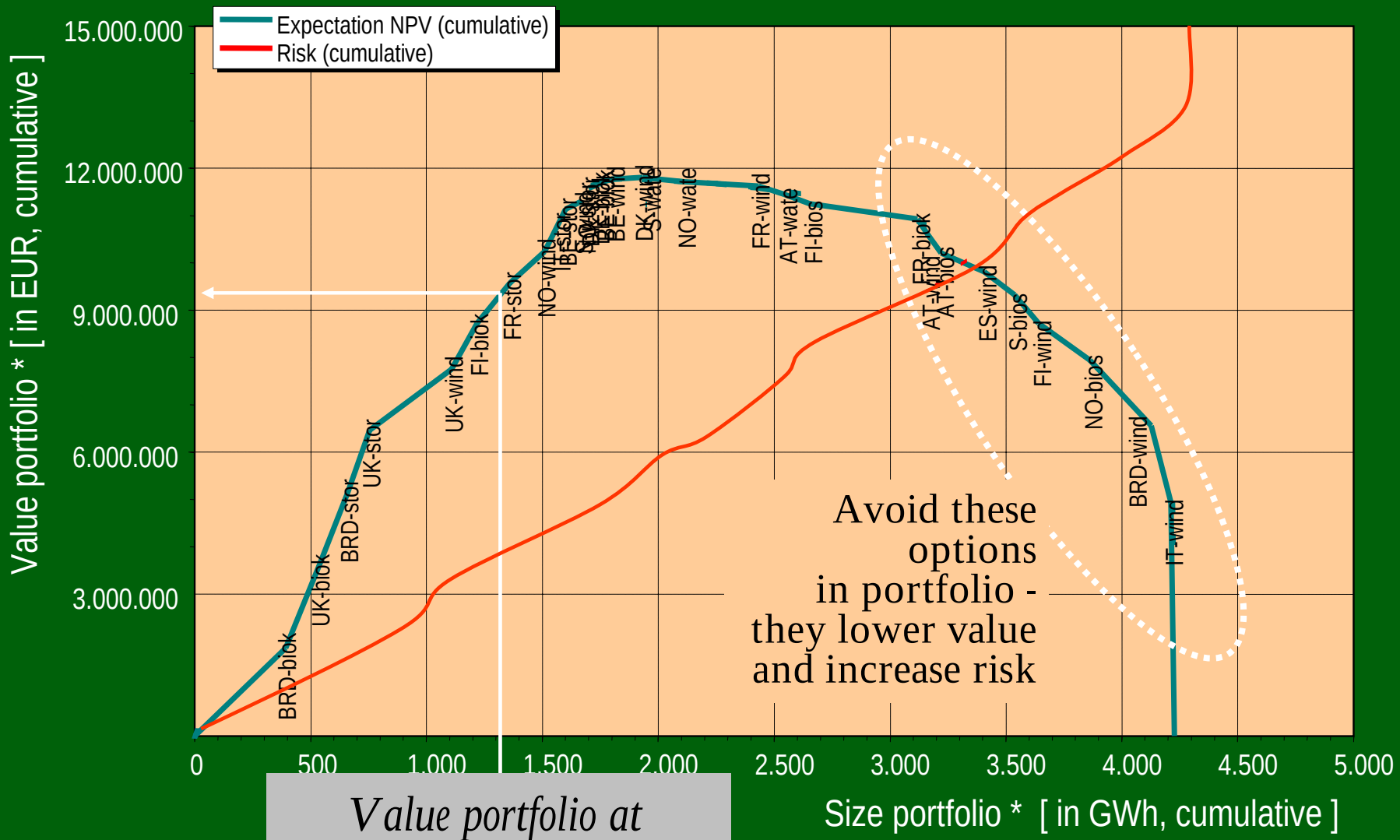
Risk management in selecting an investment portfolio



Value portfolio at 1.250 GWh as target size

* *Sample portfolio*

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Analysis show some striking “winners” and “losers”

- Striking “losers” **Wind energy in Germany and Spain**

  countries where largest investments are made

  explanation our calculation uses a higher discount than locally

- Striking “winners” **Bio-energy from coal plants and landfill gas**

  explanation high return, low investment and low risk

  Wind energy in Norway, UK, Sweden

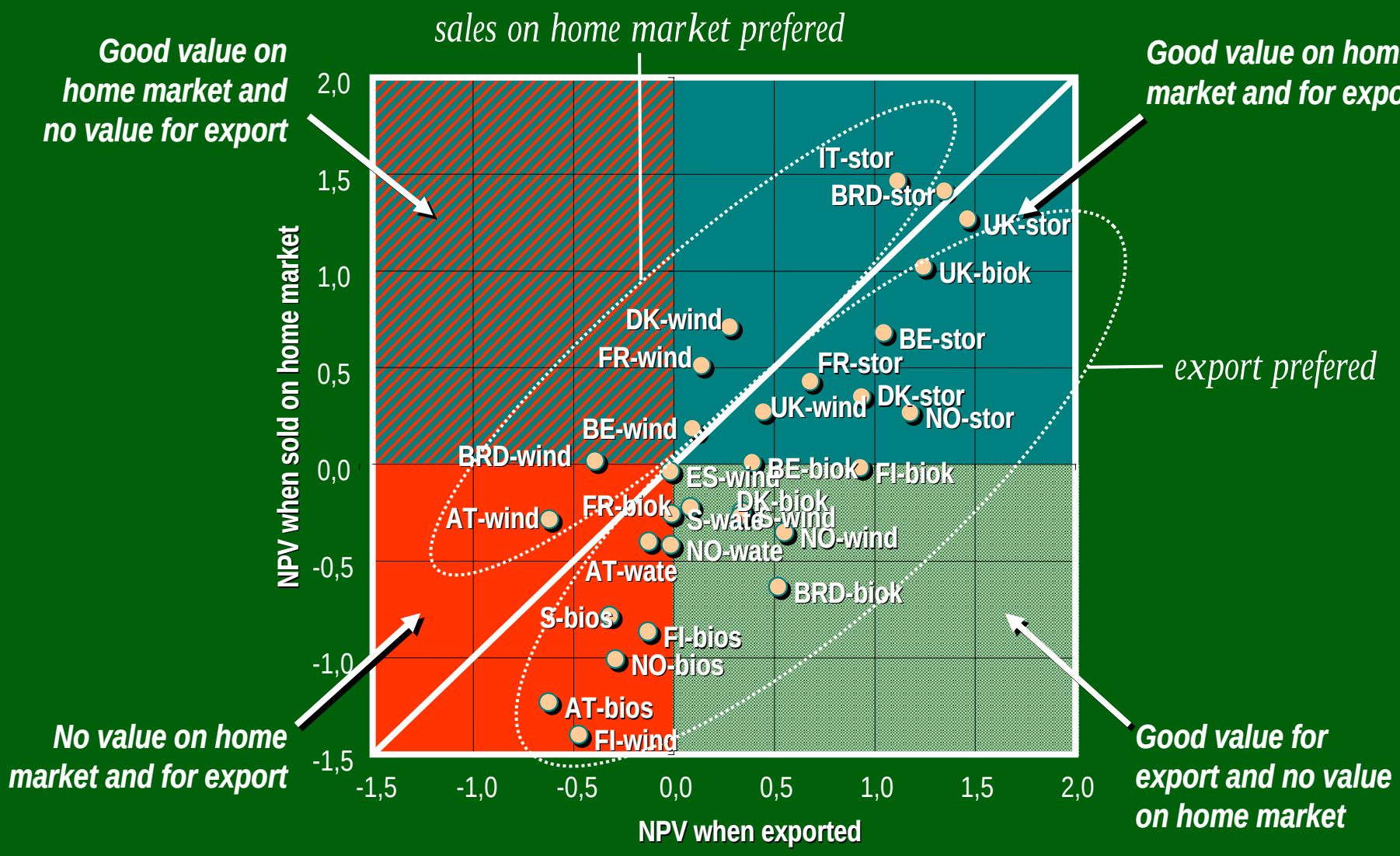
  countries with currently no investments but excellent wind climate

  explanation export low production costs offer in combination with

Example case II : serve home market or export ?

- Background situation:
  - Investor in renewable energy
- Options to consider
  - where to **sell** in Europe
  - how to maximise profit and lower risk
- Main sources of risks
  - Price level of “green” on the home market
  - Price level of “green” on export market
  - Cost price of generation
  - Technological risks
  - Cost of transportation (import - export)

Deciding on market orientation for renewables in Europe



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Serving home market or export

- No universal strategy for investors in Europe exist
  - depends on country
  - depends on technology
  - depends on support system home market - export market

- In some cases **exporting** provides more profit !
  - route most likely available to “larger” companies
  - requires more expertise and resources to organise
  - possible solution for “pan European” players

- Financial support system plays an important role in risk - profit

Financial support is main driver for risk and return

	feed-in tariffs	certificates - flexible	no financial support
common char.	• fixed rates • usually fixed period • fixed technologies	• moving prices • period not determined • fixed technologies	• moving prices • period not determined • not applicable
guarantee	• government	• supplier	• depends on export market
IRR	• law maximizes • minimum set by investors and banks	• market maximizes • minimum set by investors and banks	• market maximizes • minimum set by investors and banks
largest risk	• site / technology	• regulatory change	• regulatory export mrkt

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Average returns as seen across Europe

Average project IRRs for wind

Austria		<	2%	Feed-in
Germany	2%	…	5%	
Denmark	4%	…	7%	
Spain	4%	…	7%	
France	7%	…	11%	
Netherlands	6%	…	11%	Certificate
UK	7%	…	11%	
Belgium	8%	…	15%	

Note : preliminary estimates

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Implications for investors

- For all
  - always avoid high risk - low return options
- For pan-European players
  - select best possible combinations of countries - technologies
  - apply some diversification to reduce risk
  - this means: some countries excluded
some technologies excluded
- For individual players (smaller scale)
  - focus on best performing technology and sites
  - consider fall-back option (export) for some countries
  - this means: some technologies excluded, or
accept lower IRR