Towards Triple-A policies: More renewables at lower cost

Draft results from the IEE RE-SHAPING project

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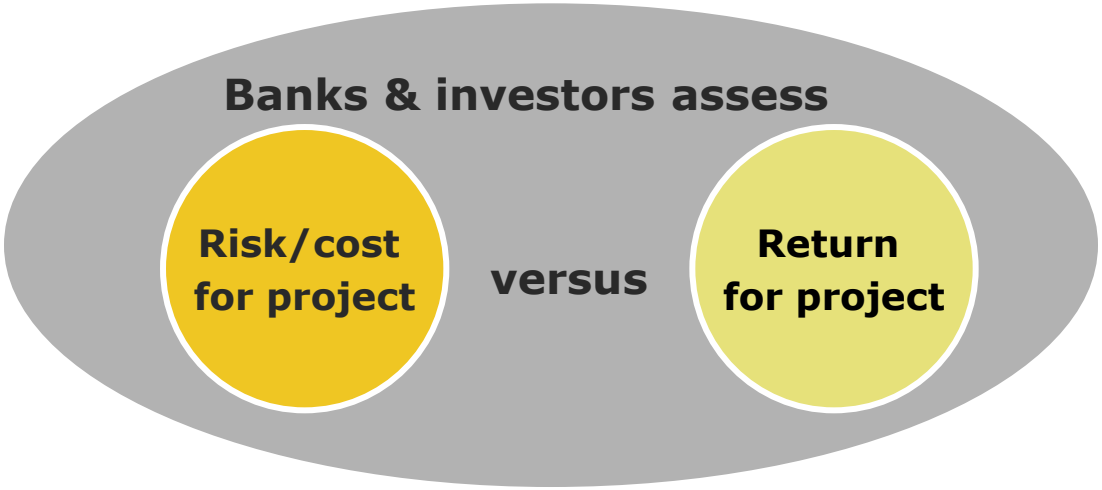
Why something needs to happen …

- Investments in RE need to double
  - Growth is too slow in many Member States
- Credit crisis reduces growth and drives up cost
  - Lenders review risks more critically
  - Worse financing conditions
  - Less projects bankable – especially affecting independent power producers & technologies/countries perceived more risky
- Institutional investors have large sums to spent at moderate rate of return, but risk-averse
- RE policy cost increase viewed more critically
  - High differences observed between countries' policy cost per MWh

… towards Triple-A RE policies



High risk = not bankable

RE policies key for project risk/cost

Traditional rating of creditworthiness:

"Greece angry with Moody's rating cut"

Triple-A rating

=Very creditworthy: Low default risk

=Lenders eager to lend, investors eager to invest

=Low risk premiums → Low interest rates → Low cost for debt

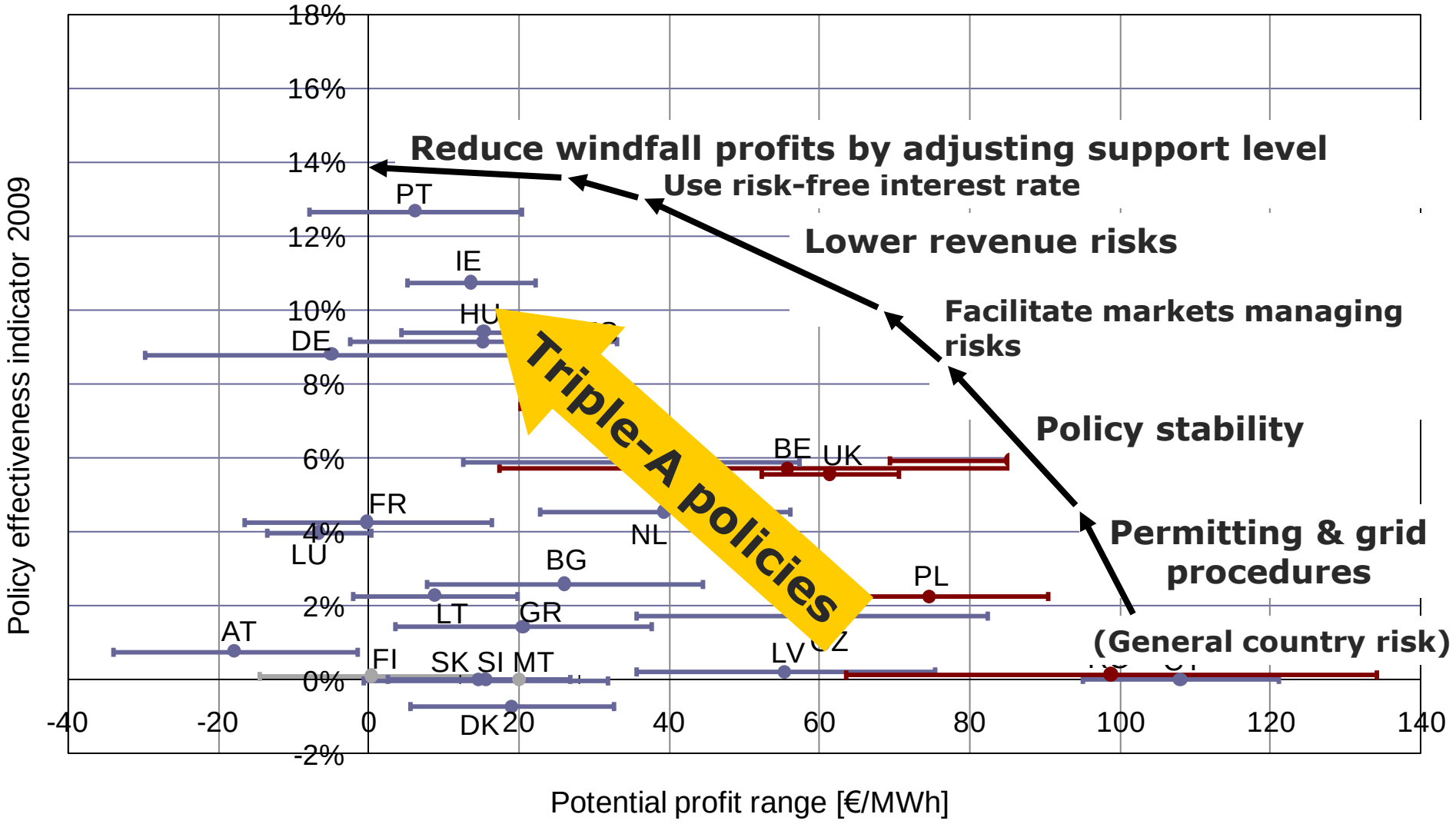
'Rating' of RE policy framework:

Implicitly done by developers, investors & lenders

Countries with triple-A RE policies will experience more RE growth at lower cost

- EU overall by €4bn annually
- This study: 20 policy options that can each reduce levelized cost by 2-20+%

Policy effectiveness (growth) versus policy cost efficiency - wind onshore 2009



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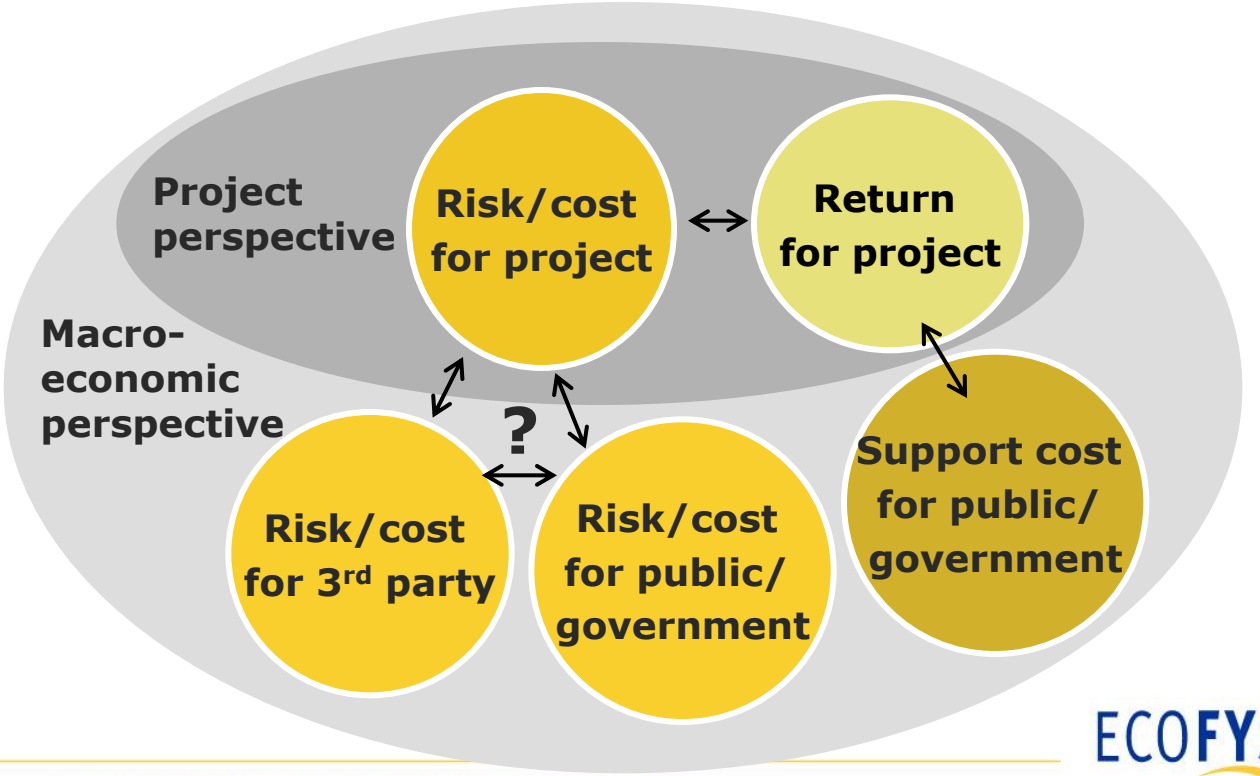
Who is best prepared to bear the risk? 1/2

1. Consider both project & macro-economic perspective
2. Recognize that different parties can bear the risk
3. Recognize that different parties have different options to mitigate risks at different cost and with different societal benefits ➔ macro-economic result will vary
4. Recognize that one policy does not fit all: Optimal allocation and treatment of risk will differ between countries and technologies.



Who is best prepared to bear the risk? 2/2

rather the
RE project

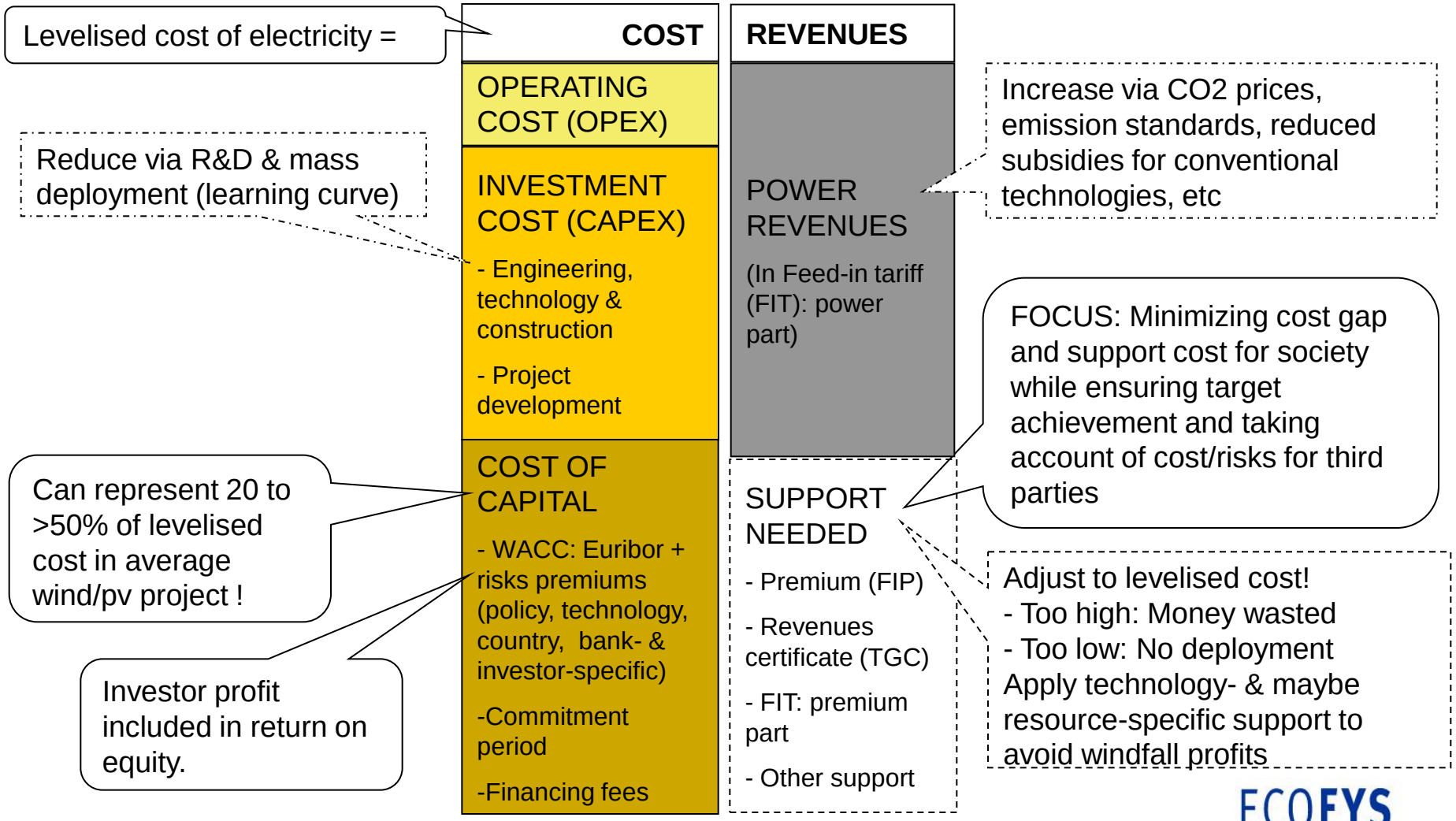
Macro-economically optimal allocation and treatment of risk depends on

1. Technology-specific risks and technology maturity
2. Country-specific technology deployment status
3. Country-specific electricity market design and structure
4. Project size and investor group
5. Influenced by dominating macro-economic paradigms

rather the
'public'

- **Construction risk**
- **Technology risk**
- **Operation risk**
- **Biomass price fluctuations** (cost risk)
- **Annual variability of wind/solar** (revenue risk)
- **Power revenue risk & balancing demand-driven RET** (FIP & quota system)
- **Power revenue risk & balancing supply-driven RET** (FIP & quota system)
- **Certificate revenue risks** (quota system)
- **Curtailment in case of grid congestion** (revenue risk)
- **(Offshore) electricity grid development**
- **Monetary policy risks** - interest rates, exchange rates, inflation
- **Permitting & grid access complex & intransparent**
- **Abrupt policy changes or budget/capacity caps**
- **Retro-active policy changes**

Cost categories for quantifying policy options & wider policy context



Structure for analysing policy options

Cost			Revenues		Levelized cost saving potential	Removing development constraint
Cost of capital	Investment cost	Operating cost	Power revenues	Support		
€=e.g. -50bp	€=-2.5%	€=-8%			>10%	+++

Observed effect in practice leading to this cost

€	**= Cost are reduced** or **revenues increased** by an amount **corresponding to ~2% lower levelised cost of electricity** (for average wind/pv project - no fuel cost)
€ (bold)	**= minimum** confirmed by most interviewees/literature
€ **(not bold)**	**= range** depending on technology, project, country, literature and interviewee

Draft results based on perception of market parties, literature and consortium expertise – feedback welcome!

No retro-active policy changes for operational projects

Cost			Revenues		Levelized cost saving potential	Removing development constraint
Cost of capital	Investment cost	Operating cost	Power revenues	Support		
>€€€€€				€€€€€	>20%	+++

Risk of retro-active policy changes **reduces investment certainty** and leads to higher (policy) risk premiums.

In quota systems lower price in certificate sales contracts.

No-go criterion for some investors

No abrupt (unexpected) policy changes for upcoming projects

Cost			Revenues		Levelized cost saving potential	Removing development constraint
Cost of capital	Investment cost	Operating cost	Power revenues	Support		
	€€€€€			€€€€€	>10%	+++

Abrupt policy changes **increase project development cost** for projects being implemented later than envisaged or **sunk cost** for developing projects that do never materialize.

High default rate leads to sunk cost -> Difficulty to recover -> **Negative effect on pipeline and future growth**

In quota systems lower price in certificate sales contracts.

10-30% [Lüthi]

No budget or capacity caps & continual open access to support (in FIT/FIP)

Cost			Revenues		Levelized cost saving potential	Removing development constraint
Cost of capital	Investment cost	Operating cost	Power revenues	Support		
	€€€€€				>10%	+++

Caps **increase project development cost** for projects being implemented later than envisaged or **sunk cost** for developing projects

that do never materialize.

High default rate leads to sunk cost -> Difficulty to recover -> **Negative effect on pipeline and future growth**

Cap = Gamble

10-30% [Lüthi]

Alternative to cap: Frequent/growth-related/automatic tariff adjustment

If cap is to be applied:

Make support decision early in project development when investments at stake are still low. Trade-off: Projects not materializing delay growth

Triple-A policy options 1/2

		Levelized cost saving potential	Removing development constraint
Policy stability	⇨ ⇨ No retro-active policy changes for existing projects	> 20%	
	⇨ ⇨ Simple & transparent permitting/grid procedures	> 10%	+++
	⇨ ⇨ No abrupt policy changes for upcoming projects	> 10%	+++
	⇨ ⇨ FIT/FIP: No budget/capacity caps & continual access to support	Plus 10%	+++
'Policy stabilizer'	⇨ ⇨ FIT/FIP: Support financed via consumer surcharge (off budget)	3%	
	⇨ Loan guarantee	5%	
	⇨ (Temporary) government participation (e.g. wind offshore)	5%	
	EU MS Support level coordination / Minimum policy design standards	See policy stability	

Note: Not all options apply to all Member States or can be cumulated.

FIP instead of quota (Removing certificate revenue risk)

Cost			Revenues		Levelized cost saving potential	Removing development constraint
Cost of capital	Investment cost	Operating cost	Power revenues	Support		
€€	€€ + €€€*	€€		€€+€€€*	>10%	

Reduced (certificate) revenue risk

or

In quota system banks may require only contracting established companies/ technology providers in order to minimize overall project risk.

Higher cost for structuring contracts.

Idem dito: Additional performance guarantees

Not getting paid average certificate spot price due to counterparty taking margin and part of upside.

Project & counterparty taking upside at consumer cost.

***** In most quota systems currently higher prices/margins for technology and project development can be observed.
Due to / or causing high certificate prices?

FIT instead of FIP

(Removing power revenue risk & balancing cost/risk)

Cost			Revenues		Levelized cost saving potential	Removing development constraint
Cost of capital	Investment cost	Operating cost	Power revenues	Support		
€€	€	€	€€		8%	

Reduced power revenue and balancing risk

- -1% WACC [Pöyri]
- -2% WACC (4% RoE / 1% debt) [Giebel]
- -1.3% WACC [Green-X]

Lower cost for structuring contracts.

No cost for forecasting / balancing.

On top of balancing cost: Not getting paid average power (exchange) price due to PPA counterparty taking margin and part of upside.

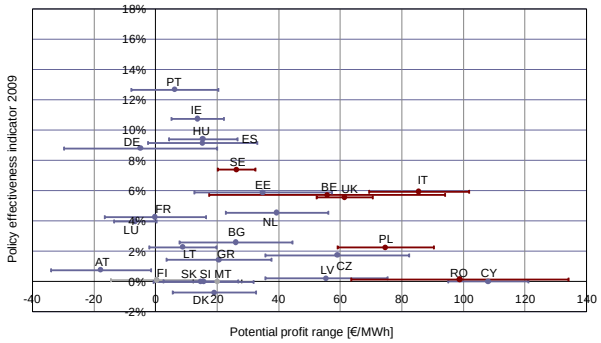
Project taking upside at consumer cost (only in fixed premium).

Increased risk/cost for 3rd party: balancing €

Triple-A policy options 2/2

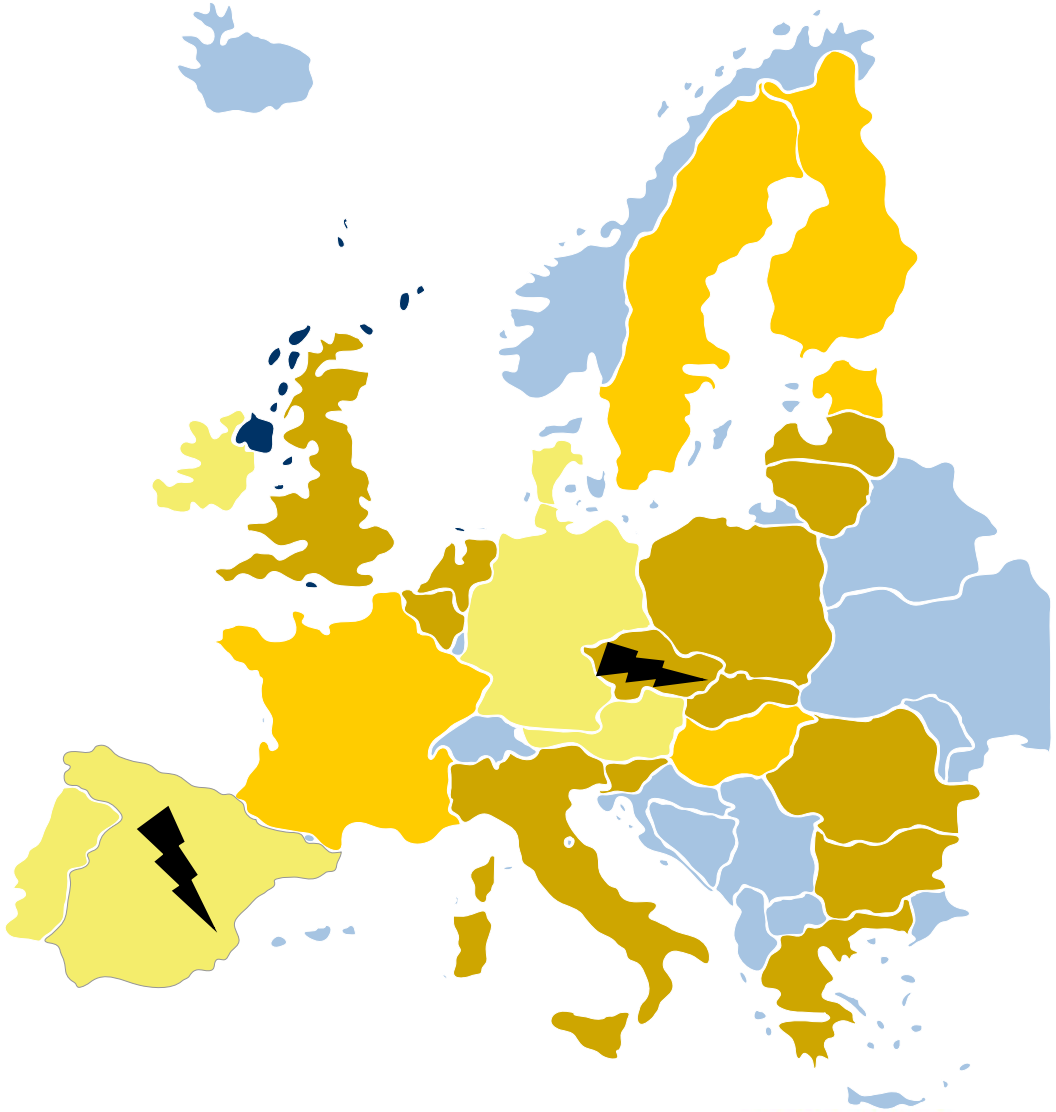
		Levelized cost saving potential	Removing development constraint
Revenue risks	*Certificate revenue risks in quota systems* ⇨ ⇨ Risk reduction: Long time horizon and serious penalties ⇨ ⇨ Risk reduction: Price floor applied ⇨ ⇨ Risk removal: FIP instead of quota system	 14% Plus 7% Or >10%	++
	Power revenue and balancing risk ⇨ ⇨ Risk removal: FIT instead of FIP	8%	
	Curtailment risk ⇨ ⇨ Grid priority / priority dispatch ⇨ ⇨ Compensation for forced curtailment	10% Plus 4%	
	Annual variability risk ⇨ ⇨ Compensate annual variability wind/solar Comparable: Wind/solar derivatives	2%	
Risk-free interest	⇨ ⇨ Front-loading the support payment stream (FIT, FIP, Quota) Comparable: cash grants or flexible depreciation	2% + 4%	
	⇨ ⇨ Soft loan	2% + 4%	+
Market facilitation	*Making project risk/performance data publicly available* ⇨Establishing process standards for risk assessment & rating ⇨ ⇨ Availability of insurance for risks not yet insurable	 4% 2%	
	Refinancing	0%	++
	⇨ ⇨ TSO responsible for grid connection (esp. wind offshore)	2%	

Country-specific cost saving potential



Saving potential	
	Large
	Medium
	Small

In Member States with too low support levels or too high barriers Triple-A policies would not reduce cost but enable growth to start in the first place.



Conclusions

- Triple-A policies can increase growth & reduce levelised cost by up to 50% for specific technologies/Member States
  - As already observed in best practice MS/technologies
  - Market player perception of policy option's can explain observed differences in policy efficiency & effectiveness
  - Effect on support cost even higher

- Triple-A policies
  - consider risk perception by investors/lenders
  - reconsider risk allocation
  - avoid unnecessary risk
  - are only one of several necessary policy actions to close cost gap and mainstream RE (R&D, CO2, conventional subsidies, windfall profits ..)

- Most effective policy options:
  1. Policy stability & removal of barriers
  2. Reducing project revenue risks
  3. Sharing risk = policy stabilizer

Thank you for your attention!

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Report will be soon available on

www.reshaping-res-policy.eu