KRAFTMARKEDET OG DE LANGE LINJENE – BLIR DET EN LØNNSOM REISE MOT 2030?

In order to assess profitability one has to look at both income and cost

INCOME	COST
POWER GENERATION	CAPEX
POWER PRICE	
SUPPORT (CERTIFICATE PRICE)	
GUARANTEES OF ORIGIN	• Property and other taxes • Decommissioning

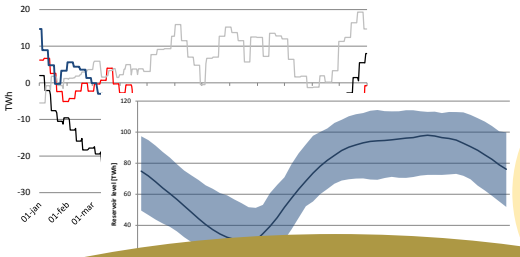
What exact do we mean with profitability? Which levels? ”Profitable” for existing generation or new investments?

GENDIATUR, QUE REIUNT EXPLABO. UT ASINCTIIS DE VOLLACCAB ISUNT ET EOS QUATIANDANDI DELLECU LLUPTIIST

Future power prices – a number of important market and political drivers to consider

SWECO

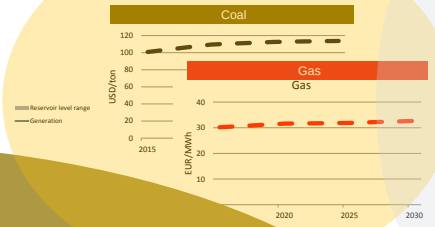
Hydrology



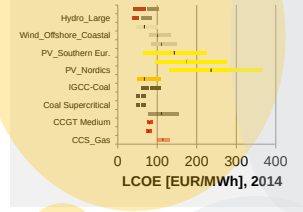
Nordic balance

+/-

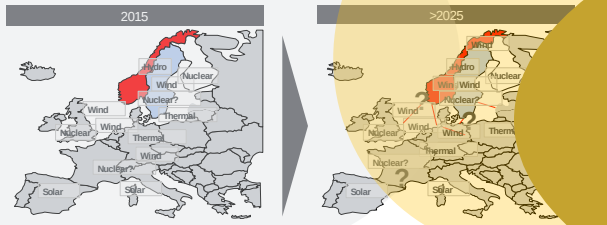
Fuel Prices



Technology development

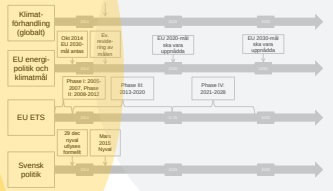


Changes in the European power system and market design

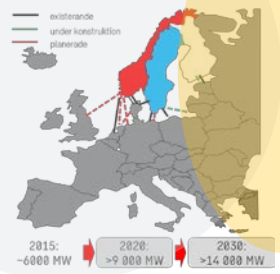


Power prices: we can calculate them but *how good are we* at *predicting them* long-term?

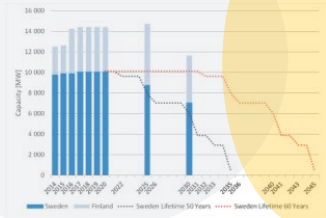
CO2 - EU ETS



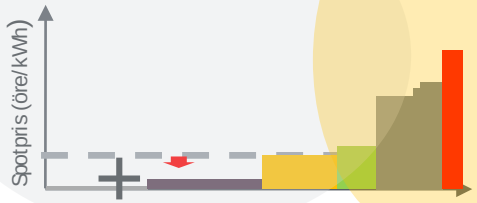
Physical market integration



Nuclear



build-out

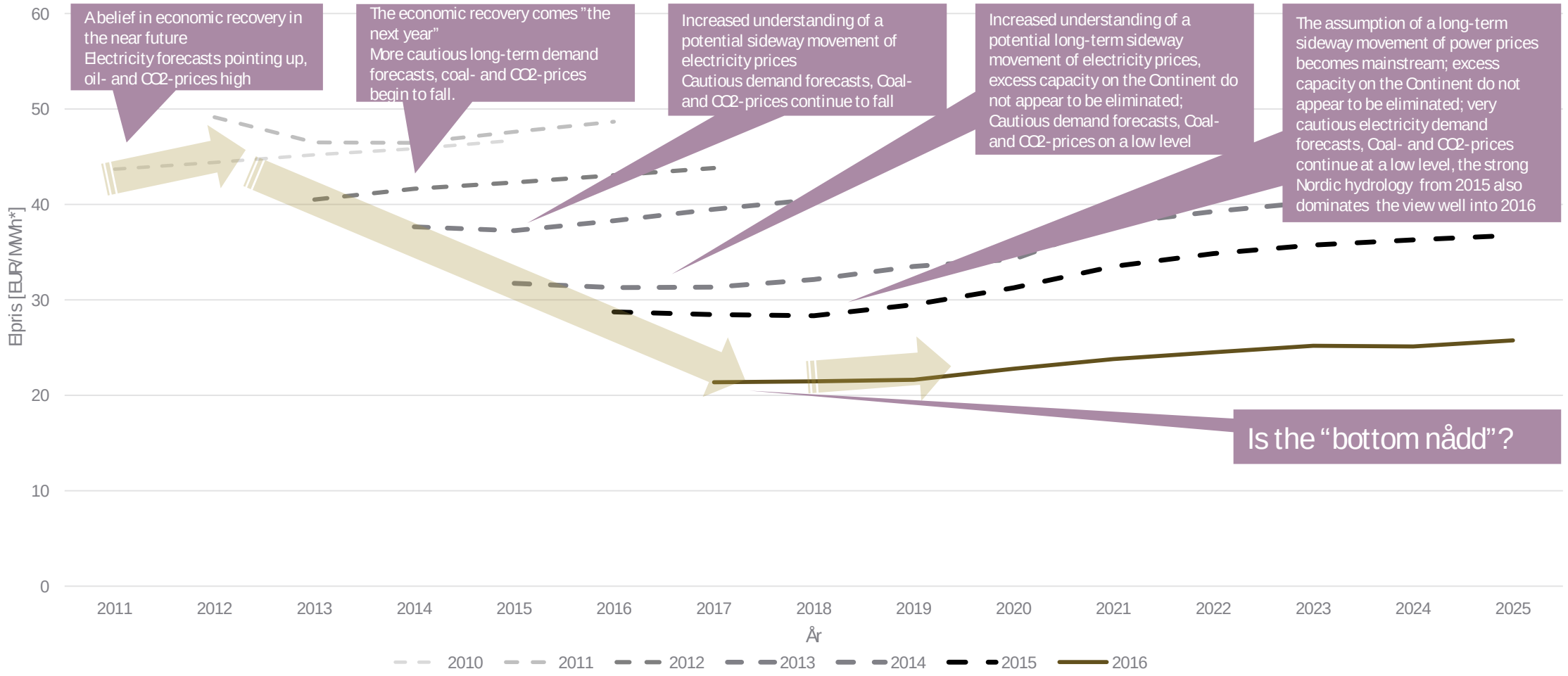


Market-driven

Politically influenced

Do forward prices give the answer?

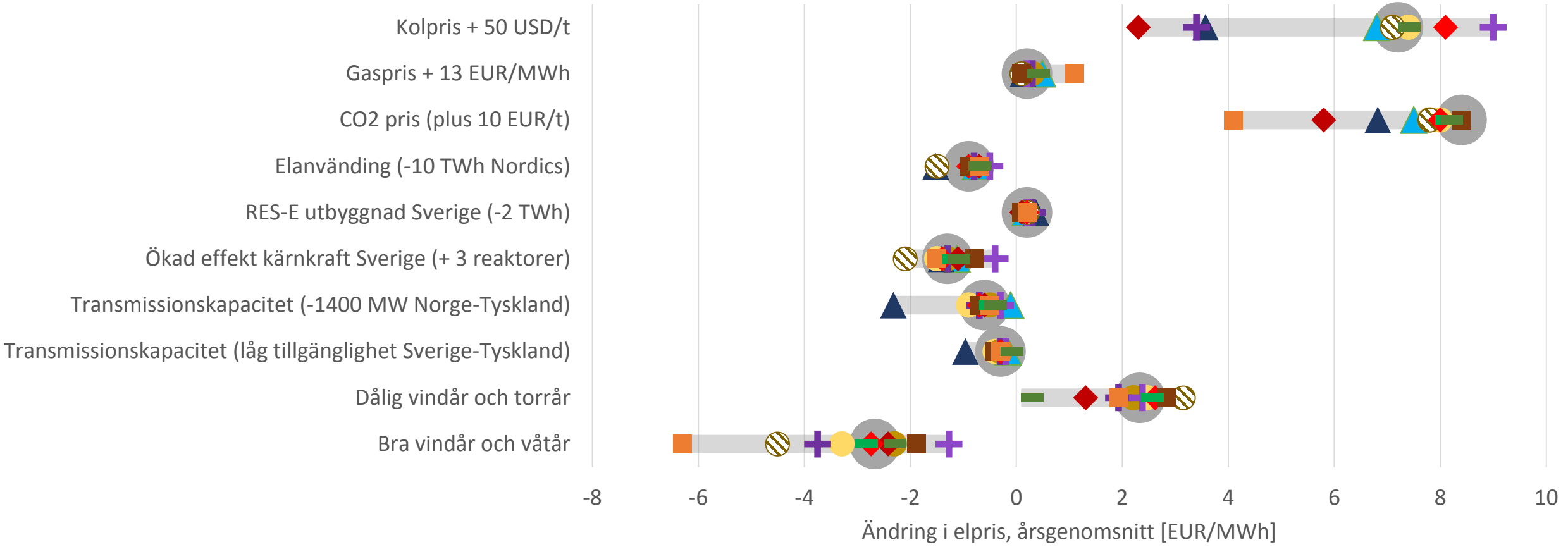
The ”Market” is *always* right/wrong – forward prices for electricity (for the year 2016) January 2010-2015



SOURCE: SWECO

Economic conditions for power production – looking at sensitivities

Quantification of the most price driving factors towards 2020

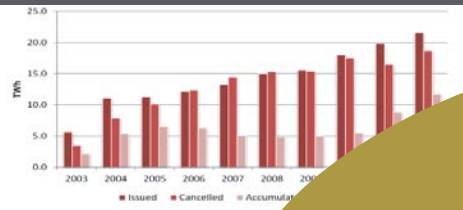


SOURCE: SWECO

Price formation for certificates is complex too, in real life

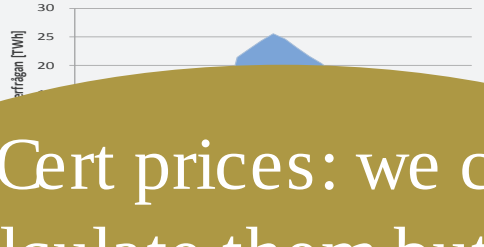
The principle is simple, but real life is much more difficult…

Certificate surplus

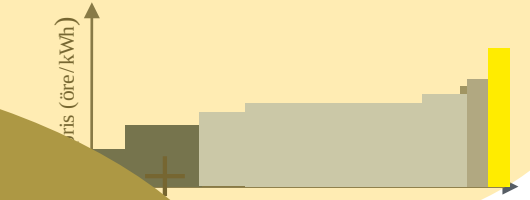


+ weather factors

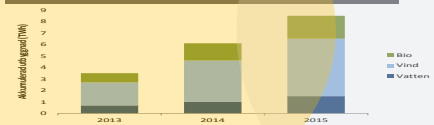
Changes in the quota curve



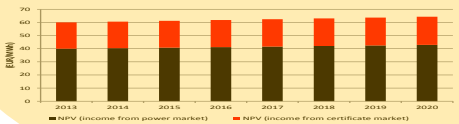
The supply curve



Build-out or not?



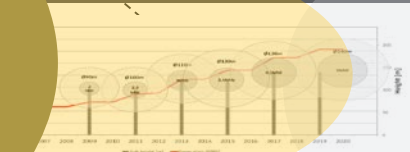
Necessary long-term profitability



Cert prices: we can calculate them but *how good are we* at *predicting them* long-term? Are we too static in our interpretation?

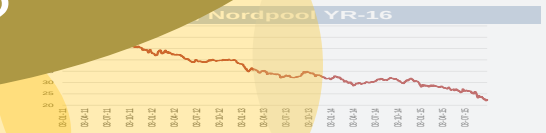
- Lar… projects – against Norway
- New investors with lower rate of return has increasingly entered the market and copes with lower certificate prices
- 1% lower rate of return roughly means 3 öre/kWh lower cost of production
- Lot of capital ”needs” to be invested

…nological development



- Large potential in terms of volume and cost reductions in the certificate market (Hydro and wind power)
- The potential is much larger than what is needed until 2020 => Great competition
- New turbines, larger generators and larger rotor blades at higher hub heights lowers LCOE => reduce the need for high certificate prices

…velopment



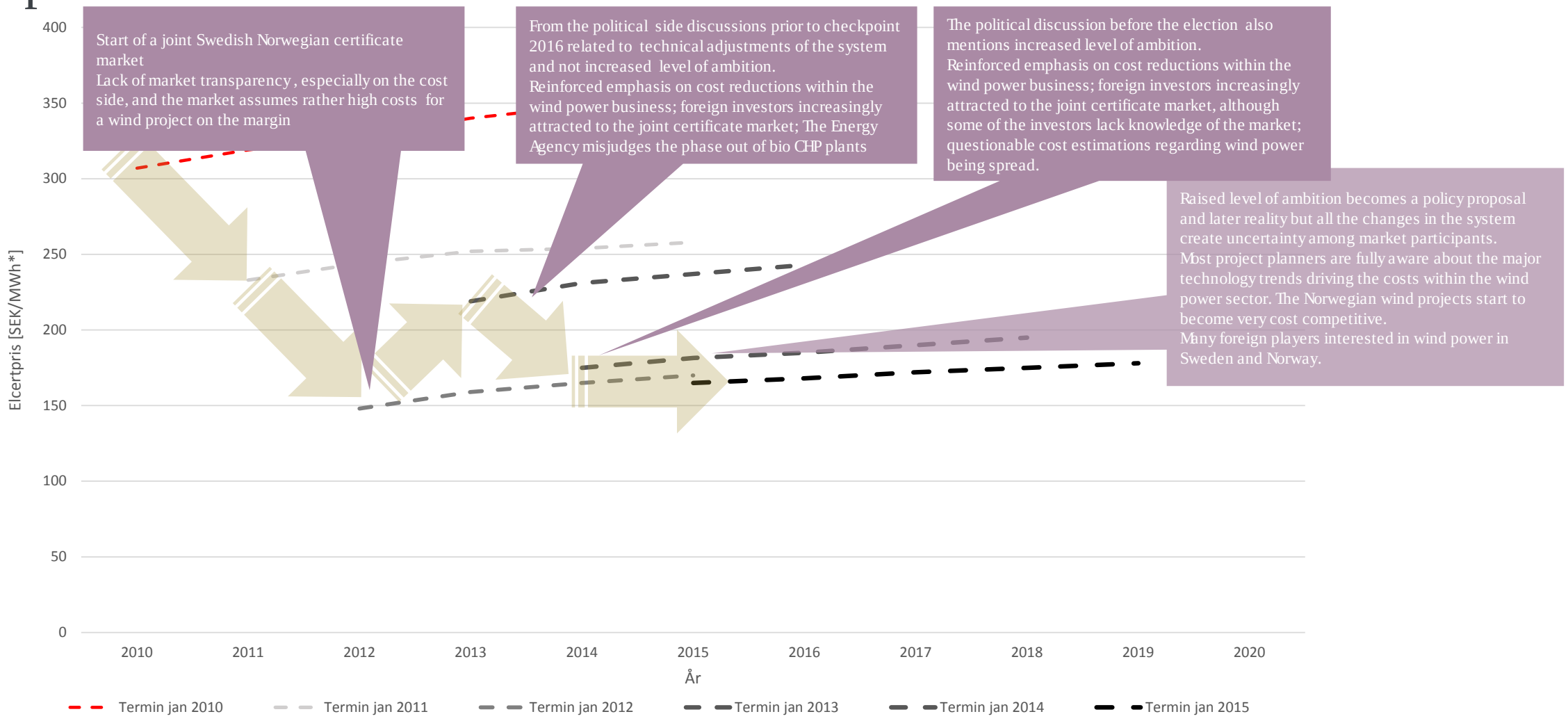
- In theory the certificate price should cover the difference between LCOE and the power price. ”Investor behaviour” and lower rate of return ”disturbs” the picture

Market-driven

Politically influenced

SOURCE: SWECO

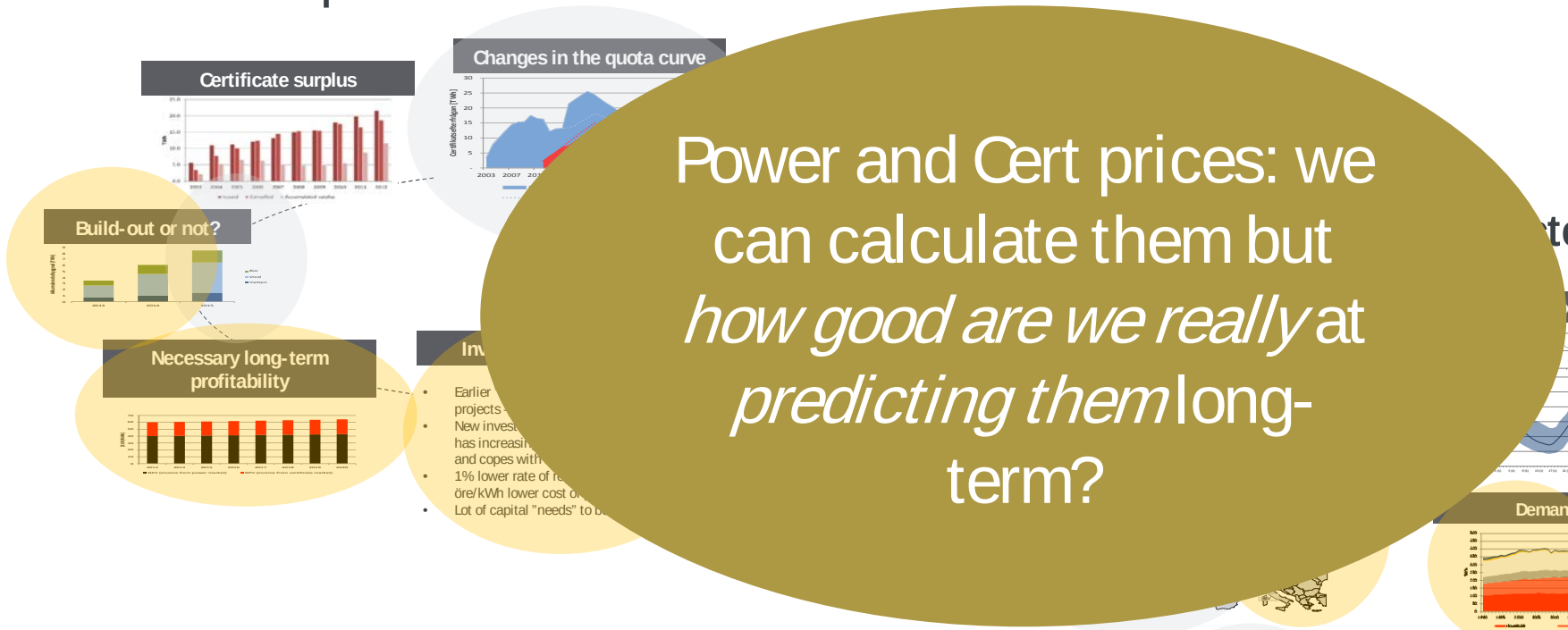
”The future is always bright” – price formation in the certificate market more complex than one might think but forecasts too simplistic



GENDIATUR, QUE REIUNT EXPLABO. UT ASINCTIIS DE VOLLACCAB ISUNT ET EOS QUATIANDANDI DELLECU LLUPTIIST

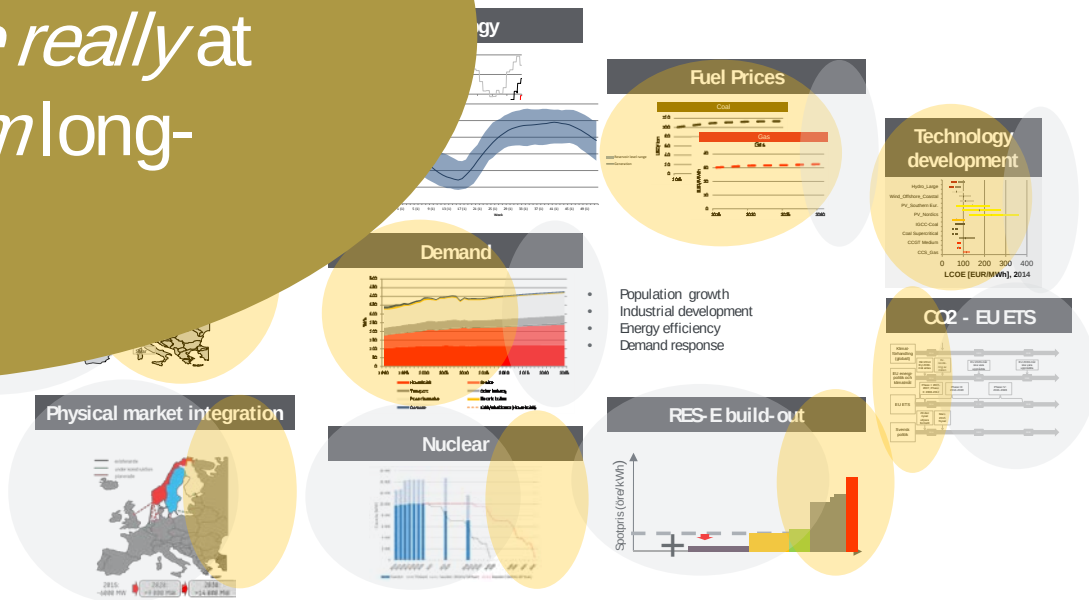
As if it wasn´t complex enough already…

The most important factors in the certificate market



Power and Cert prices: we can calculate them but *how good are we really* at *predicting them* long-term?

tors in the power market



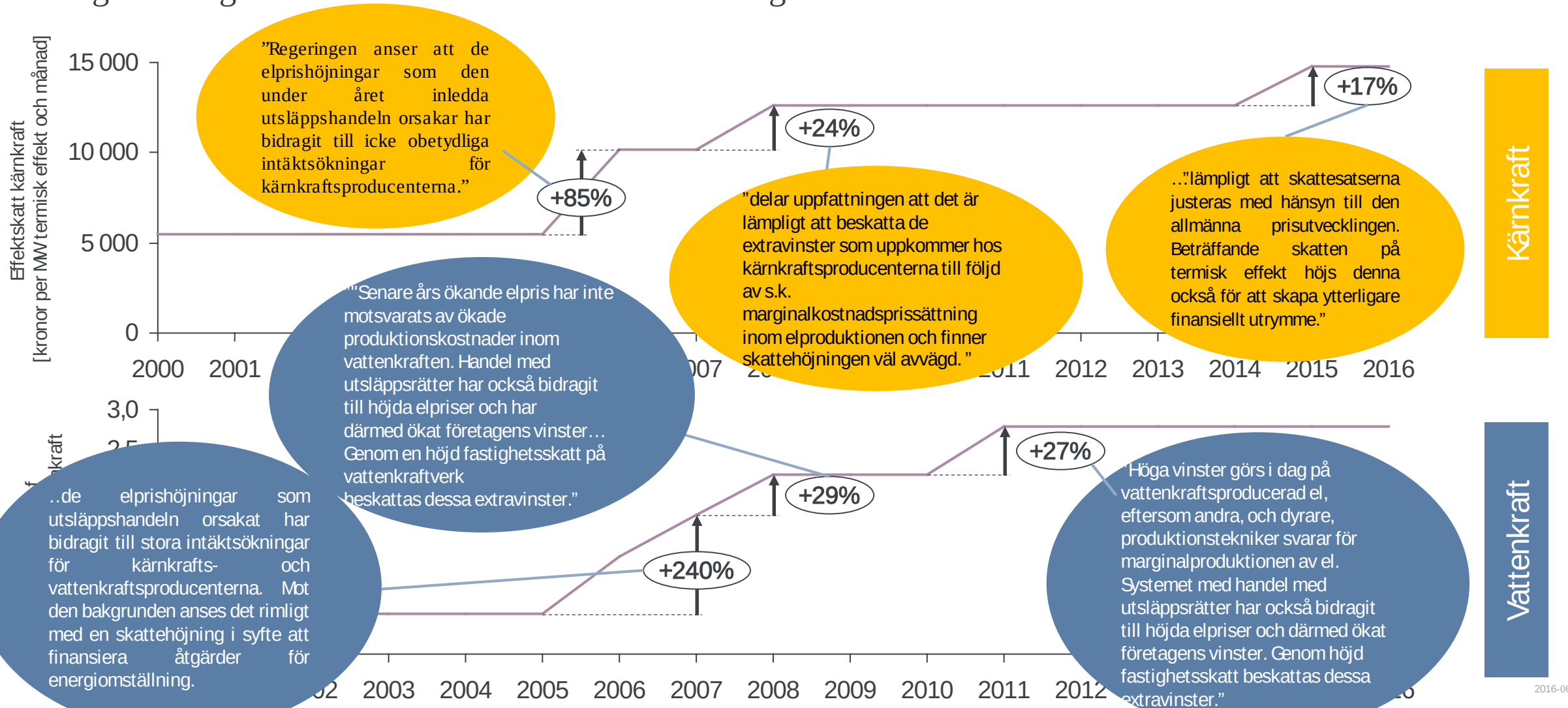
Market-driven

Politically influenced

SOURCE: SWECO

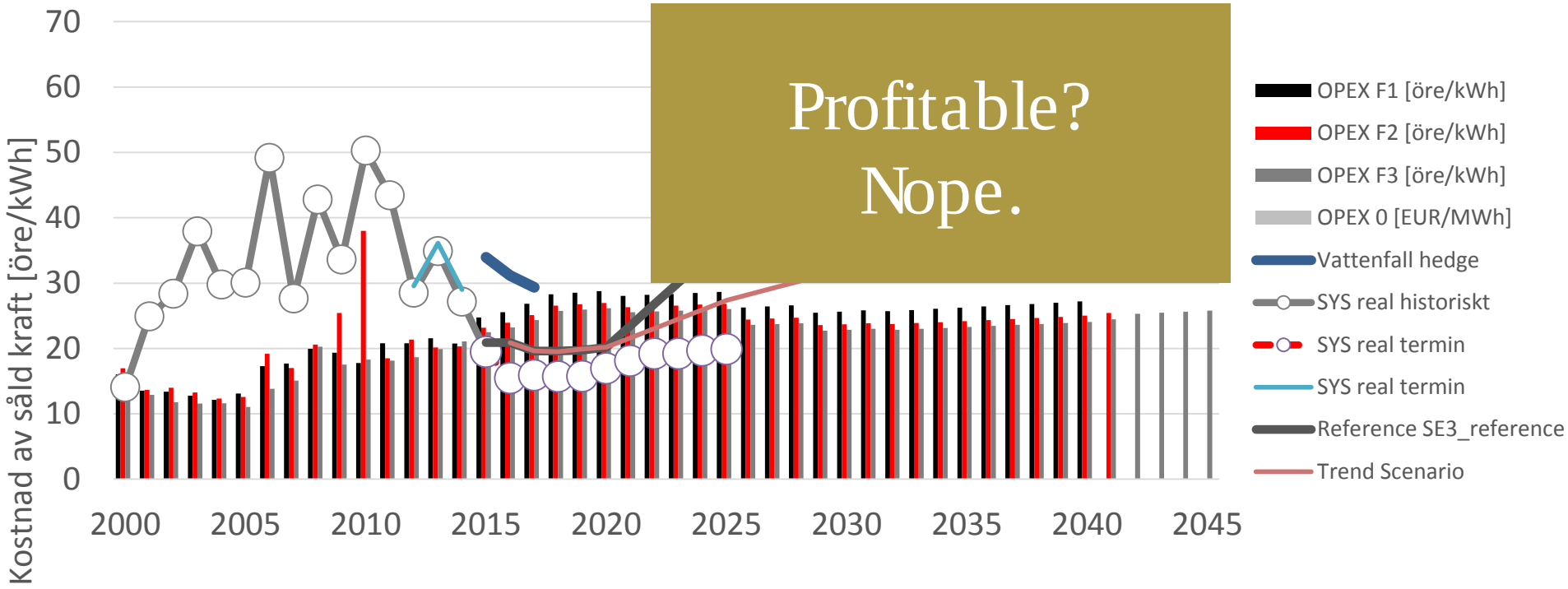
Example Swedish taxes: even cost base is ”dynamic”

Higher margins from EU-ETS have been used as argument for increased taxes several times



It’s not only a question about income - what about costs?

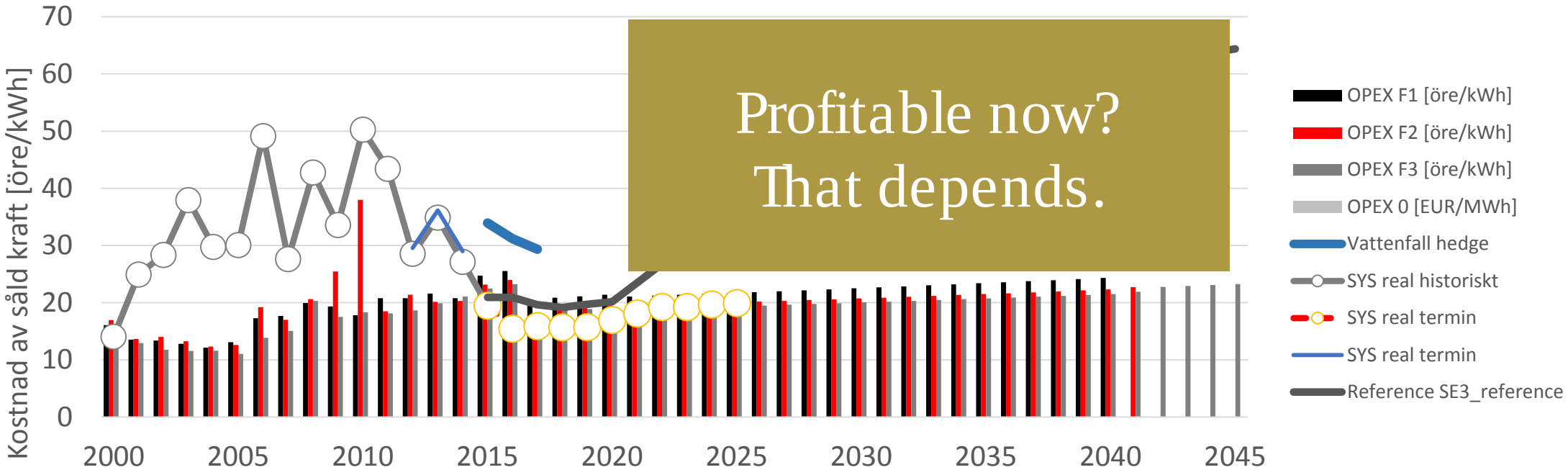
Side-kick Swedish nuclear - Forsmark BAU (including nuclear tax)



SOURCE: SWECO

It’s not only a question about income - what about costs?

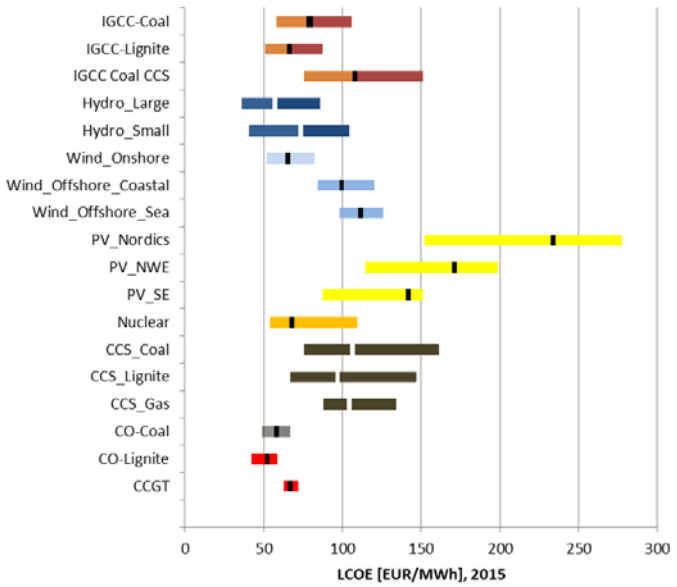
Side-kick Swedish nuclear - Forsmark no nuclear tax post 2018



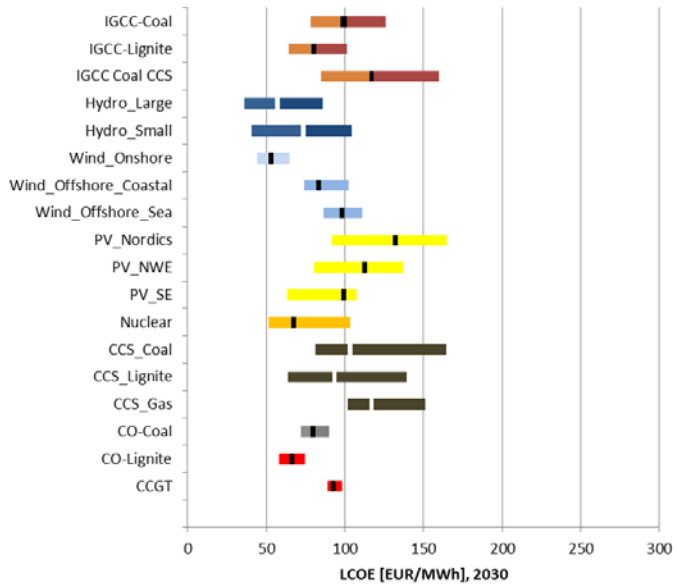
SOURCE: SWECO

Technology (cost) development will be important

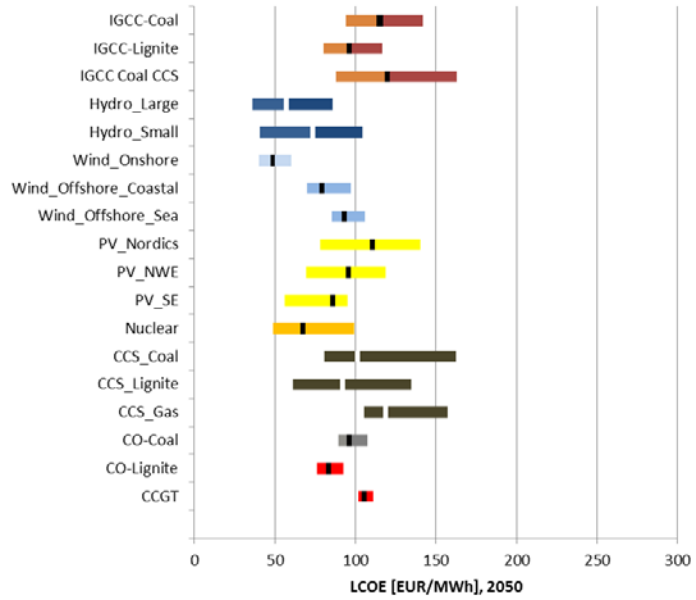
2015



2030



2050

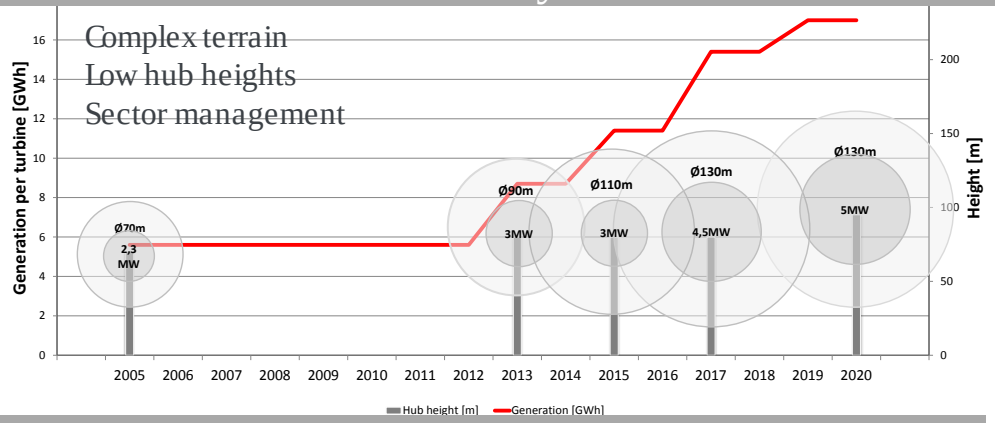


SOURCE: SWECO

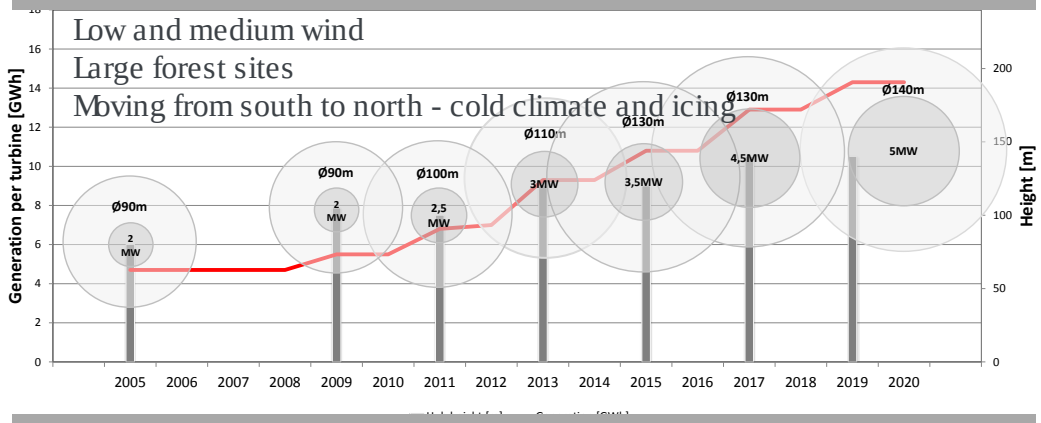
Understanding resource and technology cost development is important for evaluation of future profitability

Illustrative example

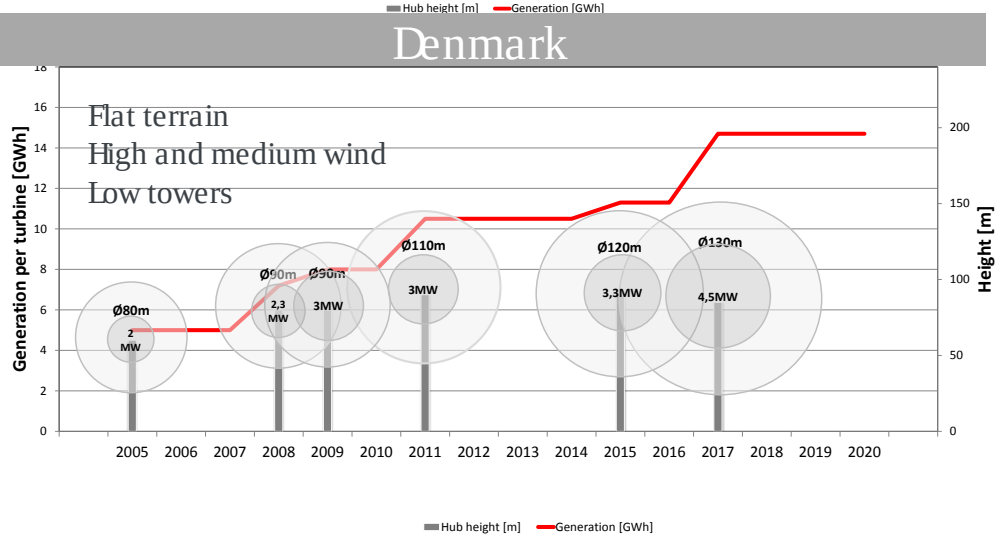
Norway



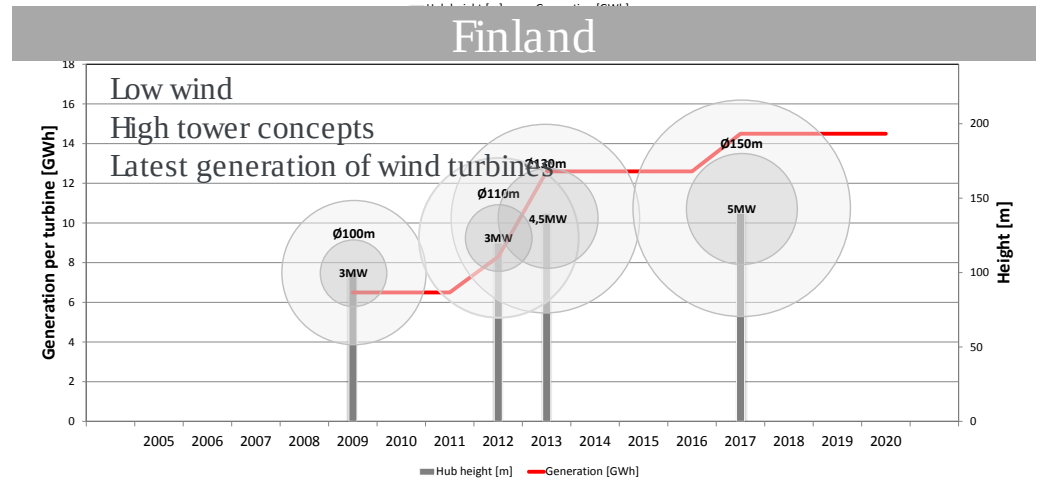
Sweden



Denmark

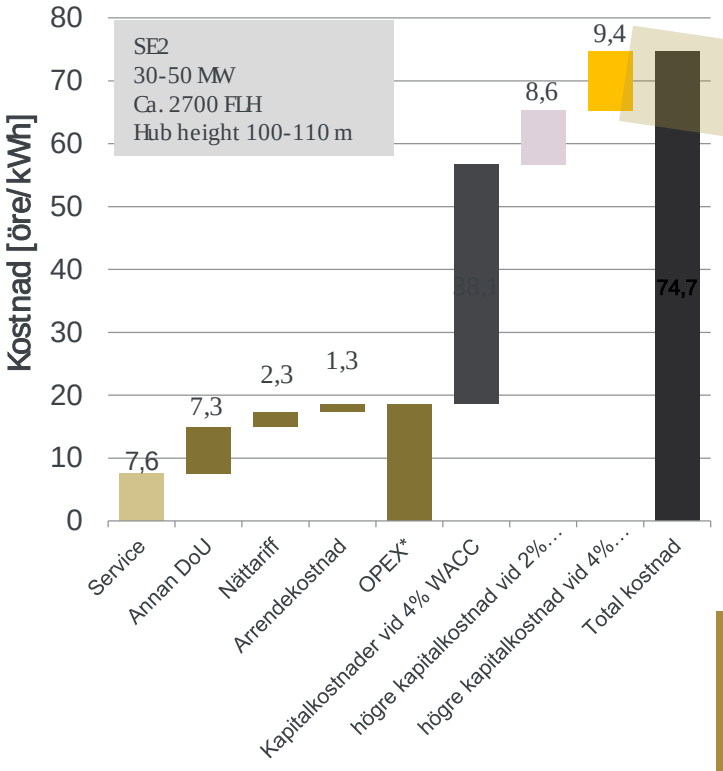


Finland

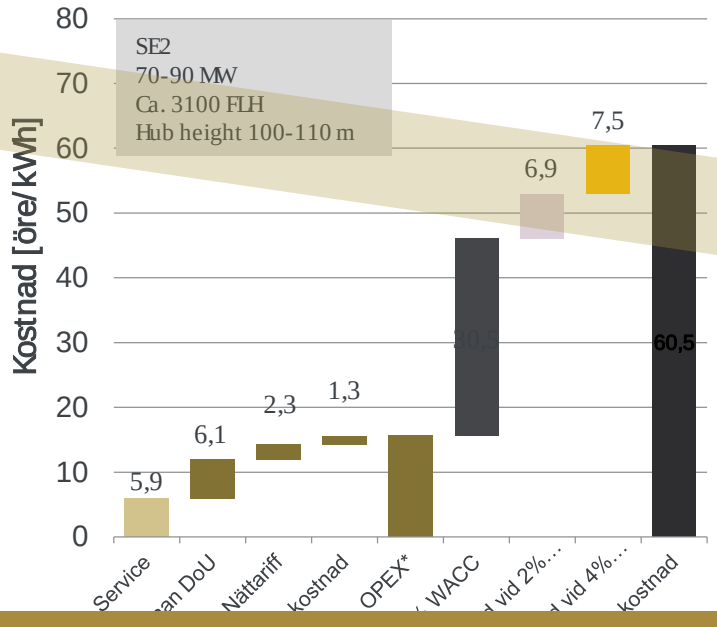


Onshore wind cost has without doubt developed quickly, but is it all just ”technology development”?

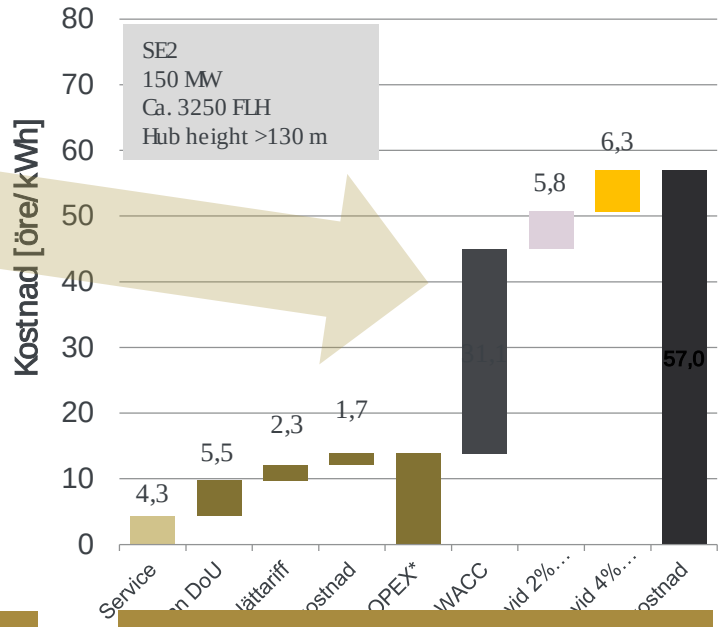
Swecoåsen 1
2010-2012



Swecoåsen 2
2014-2016



Swecoåsen 3
2018-2020



- It’s not only technology development
- It’s also project development
- The general economic climate
- ..and different actors entering the market

- Which effects are permanent, which are just temporary?

SOURCE: SWECO

Summary – be prepared!

- Income
  - A considerable number of main price drivers hinges or will be influenced by political decisions, from EU ETS over renewable targets to thermal capacity regulation
  - What your neighbouring countries do matters
  - Support schemes will still matter for the foreseeable future
  - Hard to watch (and even harder to forecast) all developments, but monitoring the most important o

No support for hours with low or zero power prices?

- Cost
  - Technology cost development expected to continue strongly for less mature technologies
  - However, other cost developments are harder to predict: they might simply be heavily politically infl nuclear taxes, grunnrenteskatt etc.

Carry more of your own costs Alignment of producer taxes in the Nordics?

- Profitability
  - Profitability doesn't just fall from heaven
  - Market factors and politics influence heavily – some directions are harder to predict than others- watch
  - Timing of investment matters
  - What about investors views in an otherwise sluggish European economy?
  - Hard to watch all cost and income driving developments, but monitoring the most important ones is
  - Power prices alone will likely not be sufficient to trigger RES-E investments shortly after 2020 without

So, is there no final answer to your question. *Sorry.*

Contact information

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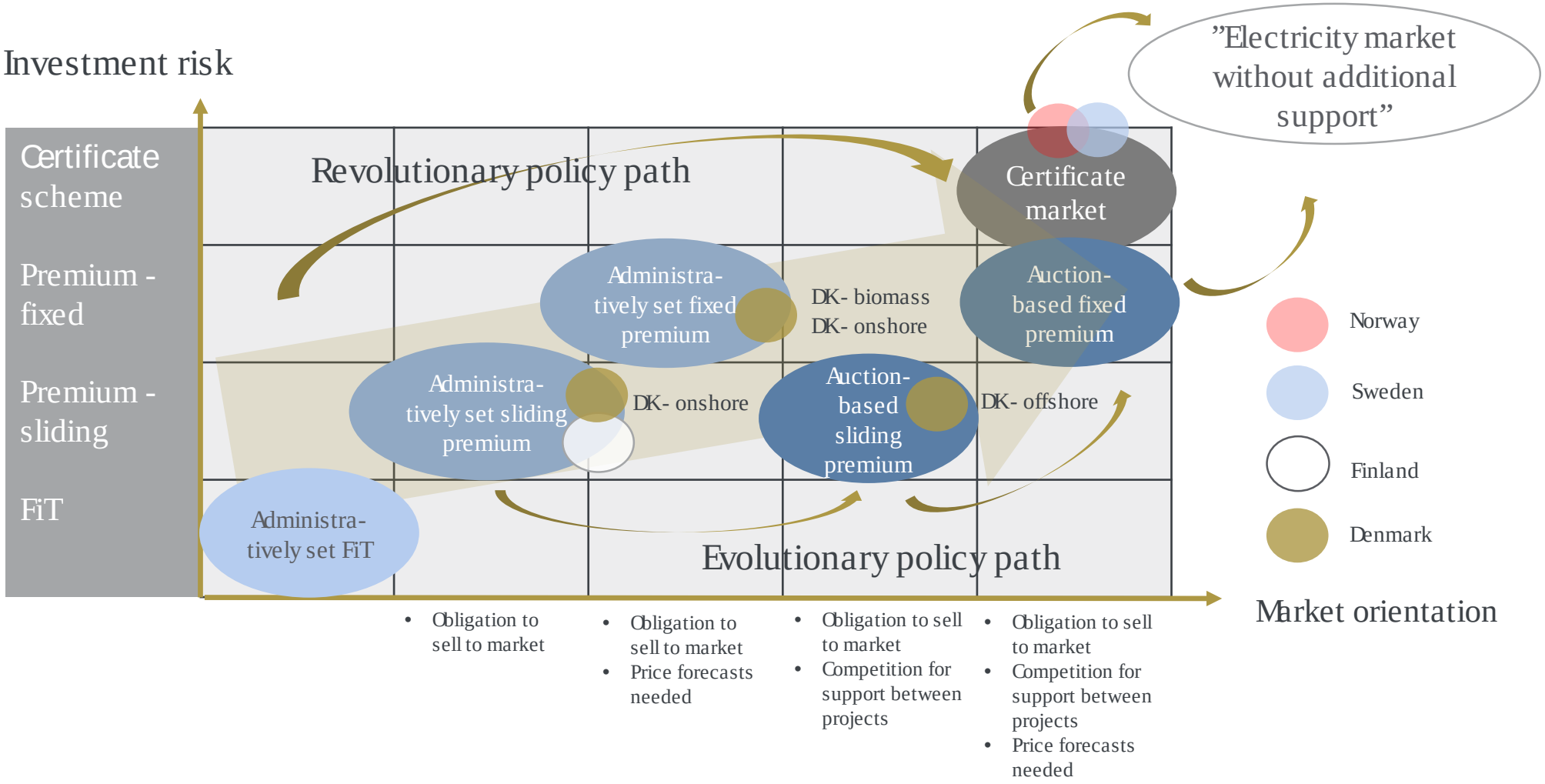
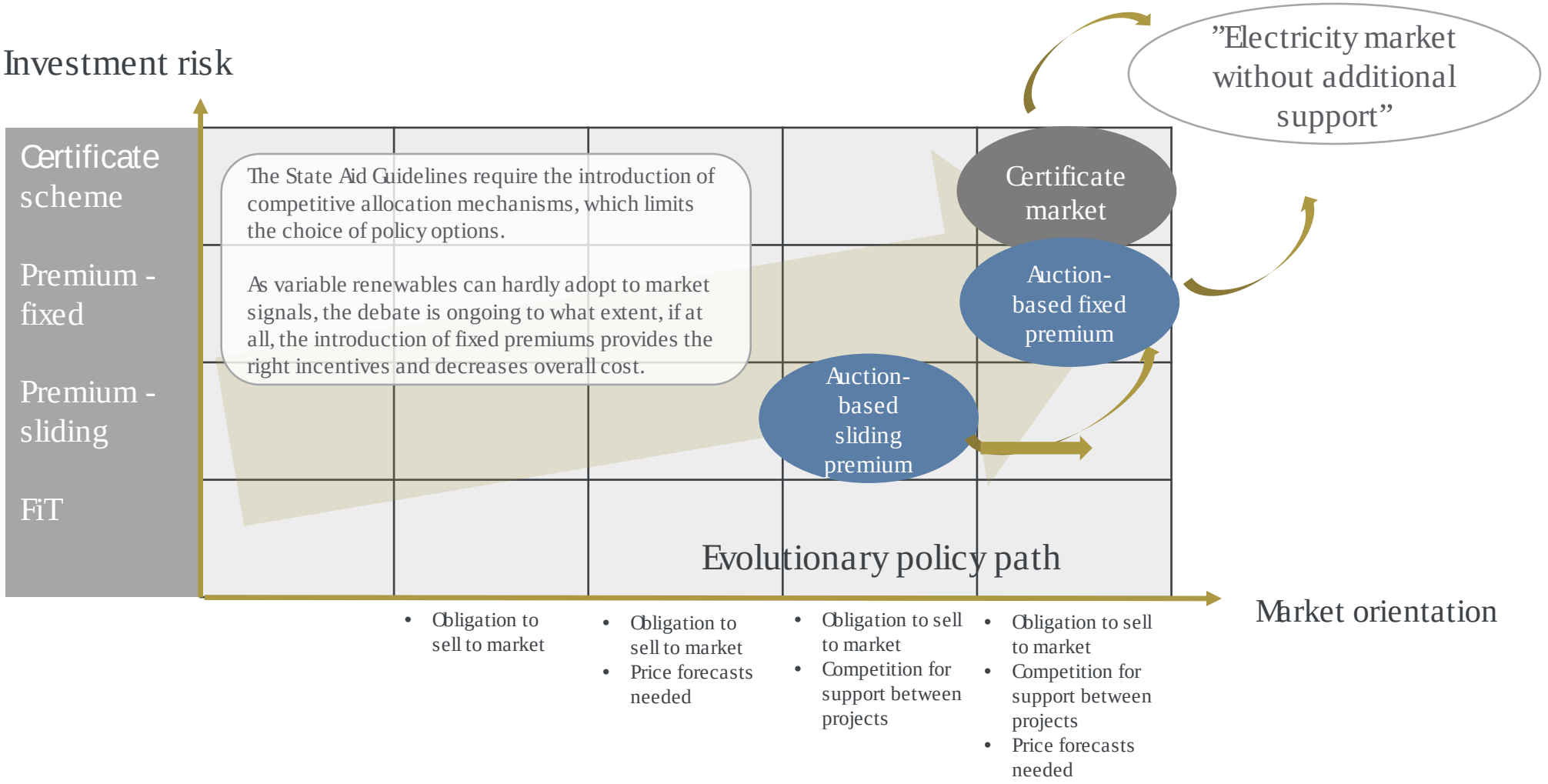
RES-E policy evolution – where are we in the Nordics?



SOURCE: SWECO

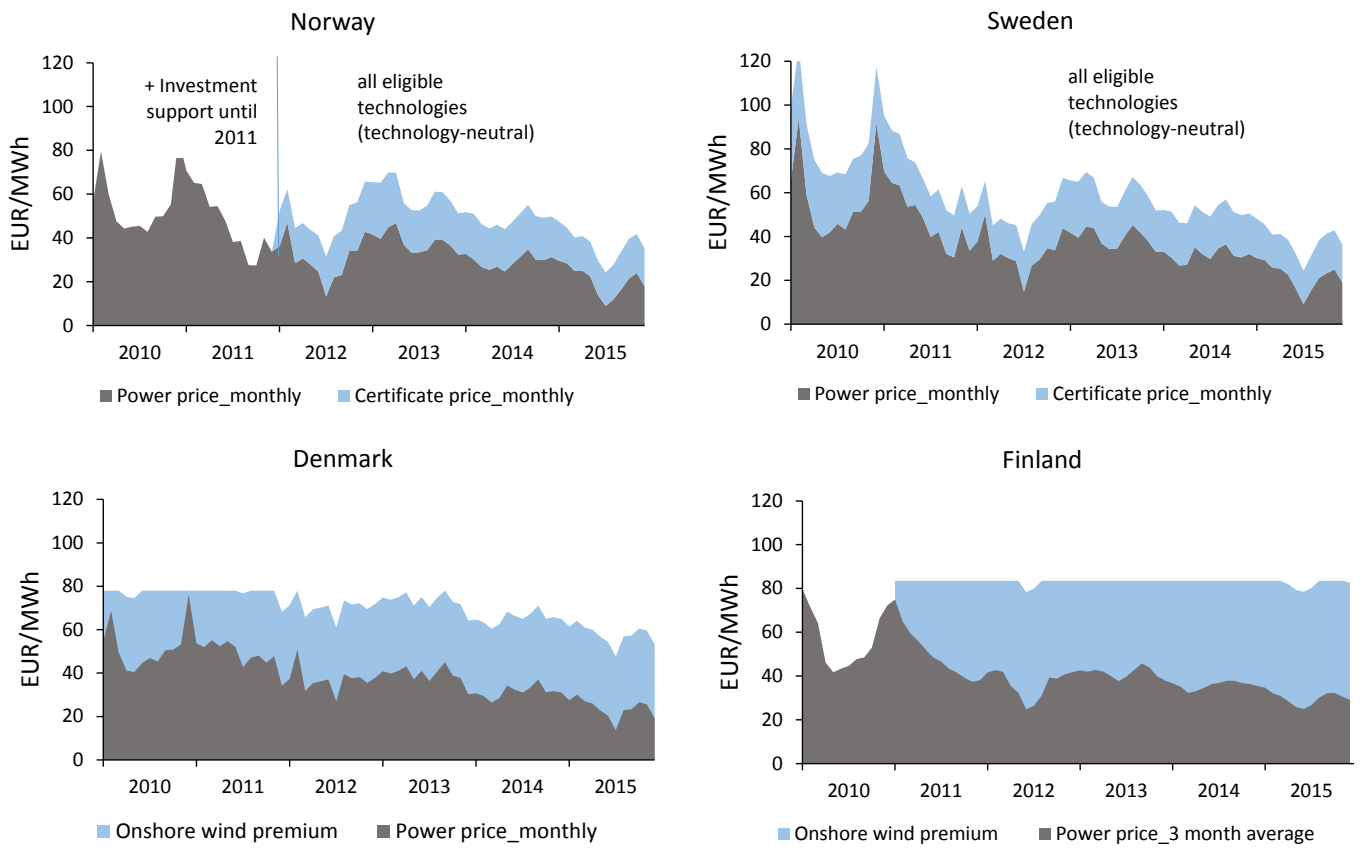
RES-E policy options for the Nordics beyond 2020



SOURCE: MWME, SWECO

Different support schemes and support levels for the same technology in the Nordics

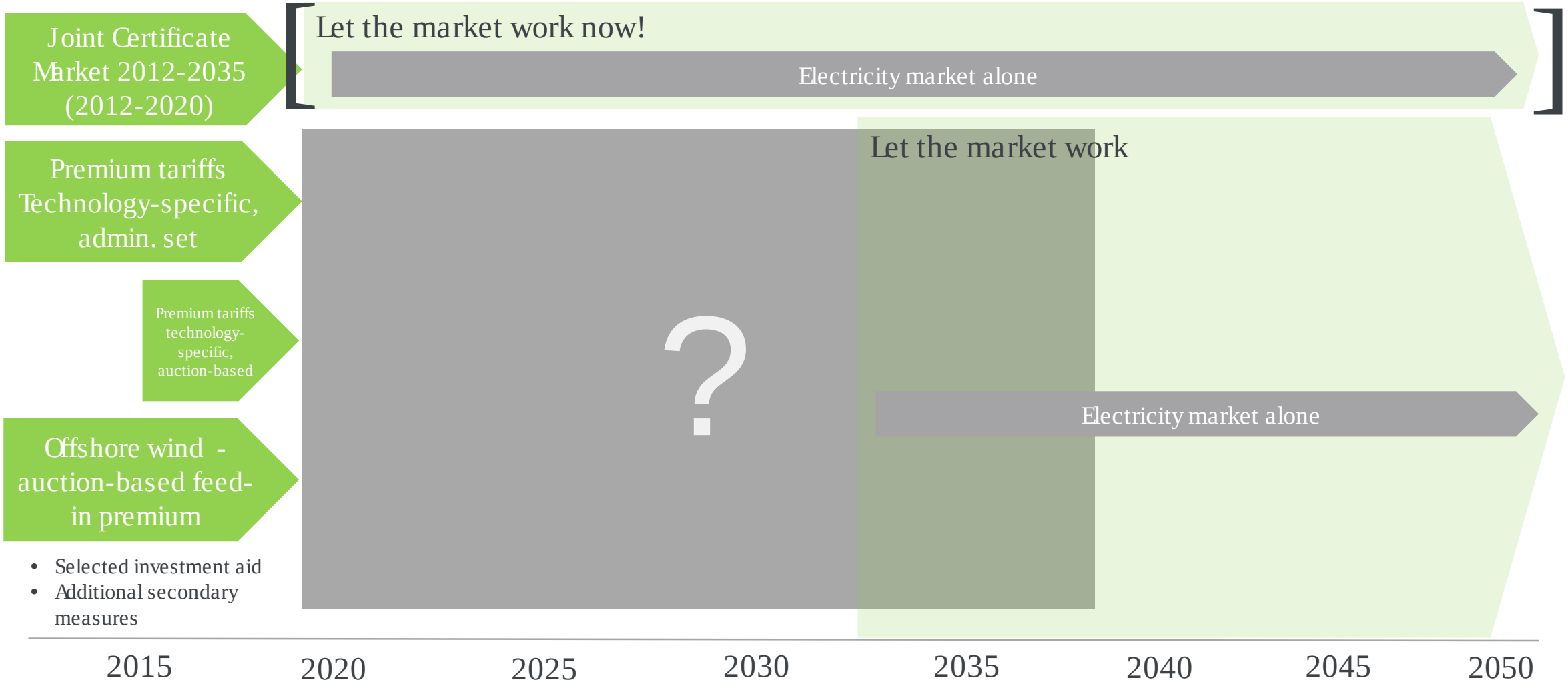
- Resource conditions differ across the Nordic countries
- Most countries use a mix of a *main support scheme* and *supporting measures*
- Both national and joint schemes are used
- For mature technologies, all Nordic countries use aid during operation over investment aid
- The Nordic schemes differ considerably in terms of degree of market integration and investor risk
- Financing differs, policy costs are increasing but capped in principle (either by duration, level or both)



SOURCE: SWECO

Talking about RES-E support schemes

What about policy path options for Nordic RES-E support?



SOURCE: SWECO

Sweco - Economic conditions for power production (2016)

Customer

Swedish Energy Commission

Overview

- Analysis of costs for different forms of power production vs different price scenarios
- Pedagogic analysis and visualization of different market conditions and political decisions

Added value of Apollo

- Quantitative power price scenarios
- Sensitivity analysis of various 2020 and 2030 (focus on politically influenced effects)

Key observations

- Investment challenges ahead for Swedish nuclear, but also considerable re-investment needs for Swedish hydro
- Nuclear tax decisive for safety upgrade decisions and therefore potential short-term nuclear phase-out

http://www.energikommissionen.se
http://www.energikommissionen.se/aktuellt/rapport-fran-sweco-om-de-ekonomiska-forutsattningarna-for-befintlig-svensk-elproduktion/