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South-East Europe Electricity Roadmap

Regulatory failures in RES-E support and the new EU rules

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REKK FOUNDATION

Overview of the presentation

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- Forms of RES-E support:
  - Institutional versus financial support
  - Role of the regulator
- Case studies:
  - Czech Republic
  - Romania
- Policy tools to curtail public spending on RES-E
- New rules in RES-E support: EU State Aid Guidelines, 2014
- Regulatory lessons

Forms of RES-E support

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Institutional support	Type	Forms
	positive discrimination	priority dispatch
		no scheduling requirement
		preferential scheduling rules
		simplified licensing procedure
	access to infrastructure below cost	shallow cost of connection
	R&D	
Financial support	for investment	grants
		supported credits
		tax advantages
		preferential depreciation rules
	for production	feed-in tariff/premium and green certificate scheme

CZECH REPUBLIC

Czech Republic: RES-E generation

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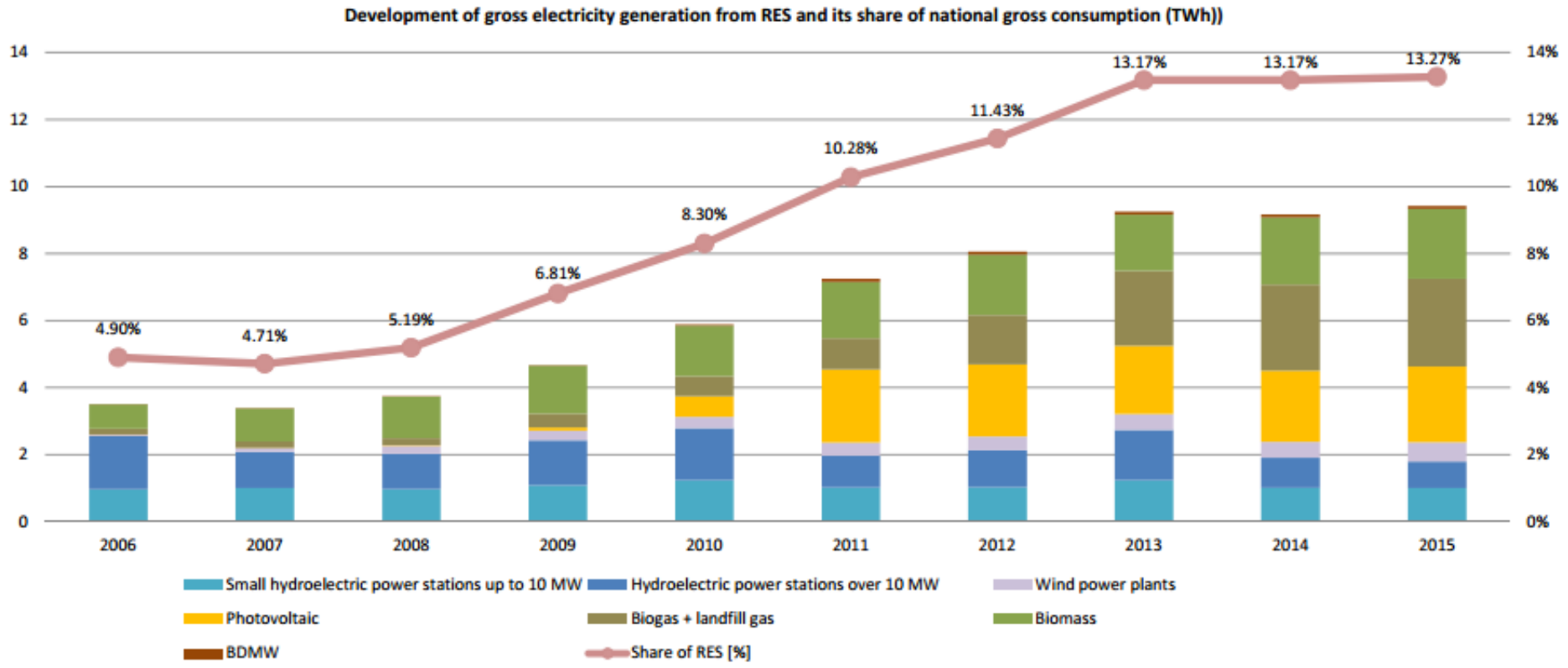
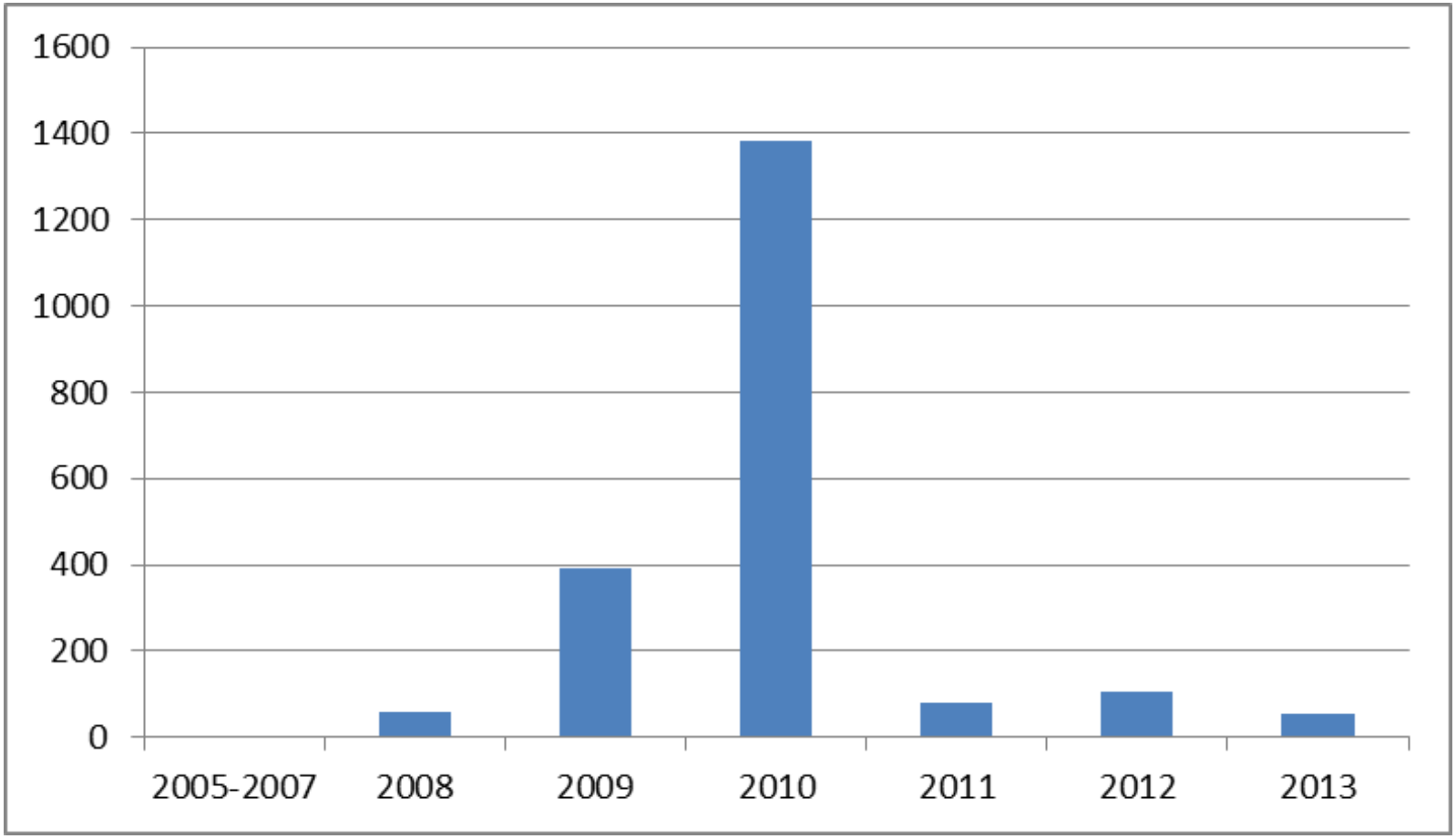


Source: ERU, Yearly Report on the Operation of the Czech Electricity Grid 2015

Czech Republic: Supported PV capacities



Source: ERU, Yearly Report on the Operation of the Czech Electricity Grid 2015

Czech Republic: PV capacities, 2015

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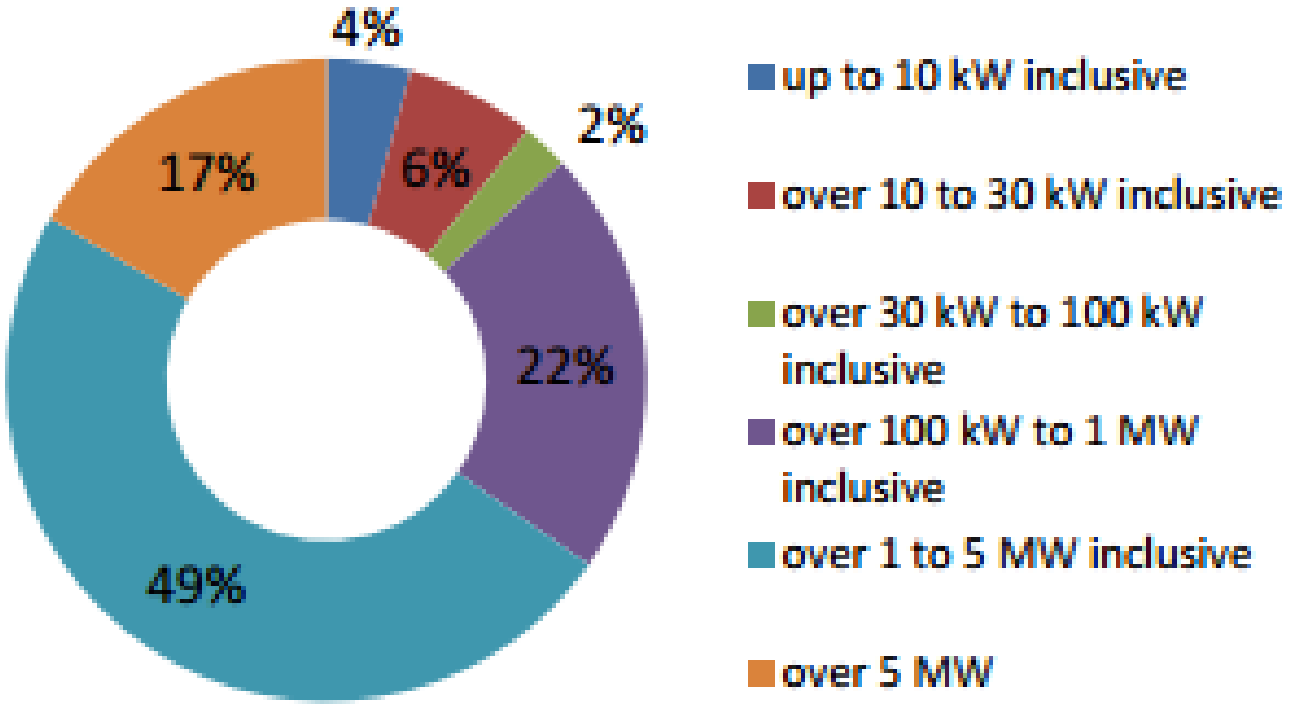
Shares of PV categories in gross electricity generation



Source: ERU, Yearly Report on the Operation of the Czech Electricity Grid 2015

Regulation: 2009-2010

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- Flexible, optional Feed-in tariff (FIT) and Feed-in Premium (FIP) system to all RES-E sources guaranteed for 15 years
- Yearly revisions of FIT levels with a maximum of 5% reduction – to protect investor's interest
- Generous FIT/FIP for PV – both small scale (rooftop) and industrial (ground mounted)
- Legal obligations protect investors: if conditions fulfilled – regulator must approve RES-E developments
- In 2009-2010: No cap on connection/support budget

Regulatory change: 2011

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- no support for new ground mounted PV installations
- ban on new Grid Connection agreements
- 26% tax on the FIT of ground mounted PV installations over 30 kW built between 1 Jan 2009 and 31 Dec 2010
- Group of senators filed the case on the imposed tax in March 2011 to the Constitutional Court (infringement of property rights) but their claim was declined

Regulatory change: 2013 (”New Renewables Act” - Act No. 165/2012)

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- Green premium becomes the default
- renewable energy plants receive the bonus in an annual or hourly mode on top of the regular market price of electricity: The annual green bonuses are set by the Energy Regulatory Office for the following calendar year. The amount of the hourly green bonuses will be derived from the market price of electricity on the day-ahead market; their amount will therefore change at every hour
- Operators generating renewable electricity to cover their own requirements only are also entitled to the payment of a bonus

Cont.

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- FIT only to small units (but plant operators may choose once a year between FIT and green bonus):
  - plants up to 100 kW
  - 30 kW in case of PV but only on roof tops or facades
  - 10 MW in case of hydro power
- 26% PV tax for units put into operation in 2010 (except for roof-top and facade-integrated installations with a capacity of up to 30 kW)
- feed-in tariffs are paid by “mandatory purchasers” (DSOs)
- New agreement needs to be signed with the DSO to enforce FIT claim (previous purchase agreements became void) that are compensated for the difference between the market price and the FIT by the market operator

Cont.

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- Selected FIT levels:
  - Wind: €ct 7.3 kWh
  - PV up to 5 kW: €ct 11.1/kWh
  - PV up to 30 kW: 9/kWh
  - Geothermal: €ct 12/kWh
  - Biogas: €ct 7.1/kWh - €ct 13.7/kWh
  - Reconstructed small hydro: €ct 9.1 kWh
  - New small hydro: €ct 11.8 kWh
- The feed-in tariffs for new plants for the following year cannot be less than 95% but also not more than 115% of the tariff applicable at the time of the calculation of the new tariff.

Regulatory change: 2014 (Regulation No. 310/2013)

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- No support (FIT or green bonus) for new RES plants - with exception of small hydro power plants up to 10 MW - connected to the grid after the end of 2013
- Operators of wind, geothermal or biomass power plants up to a maximum capacity of 100 kW, who hold a building permit issued before the amendment entered into force (2 October 2013), are eligible for support if their plant will be put into operation before 31 December 2015
- 26% PV tax is reduced to 10% but maintained
- Energy Regulatory Office refused to issue an obligatory pricing decision for 2016 regarding FIT remuneration by the end of 2015, only months later

RES-E support level: 2006-2013

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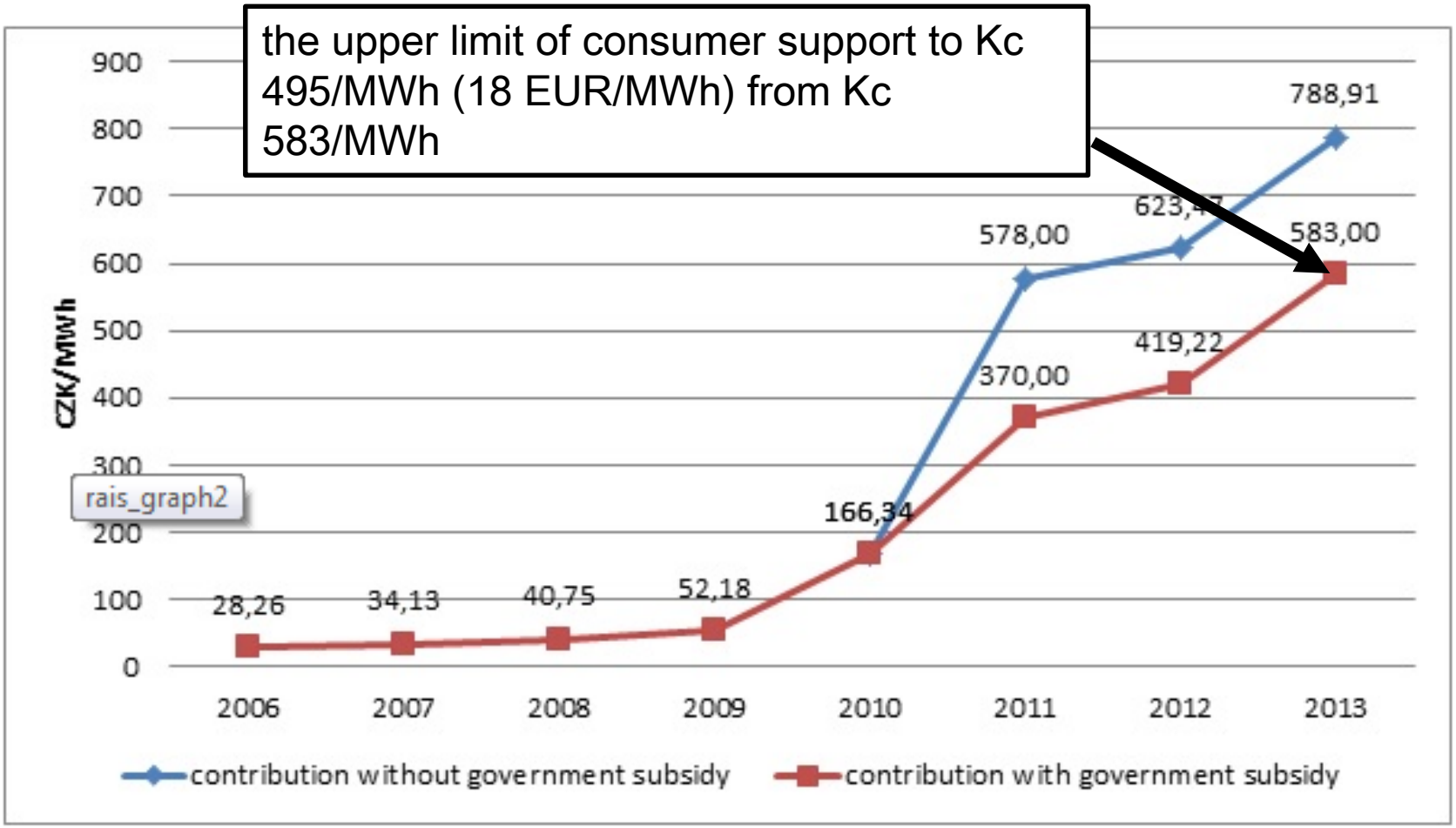

Source: Rais, based on ERÚ

ROMANIA

Green certificate scheme

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- system of green certificates since 2005
- Green certificates are issued on a monthly basis, for each kWh of ”green” electricity produced and delivered to the suppliers and/or final consumers
- The system covers all renewable technologies with a capacity limitation on hydro (10 MW)
- Suppliers are obliged to acquire a given quantity of these certificates each year, based on their sales to final consumers

The quota obligation: balancing between ambitions and cost

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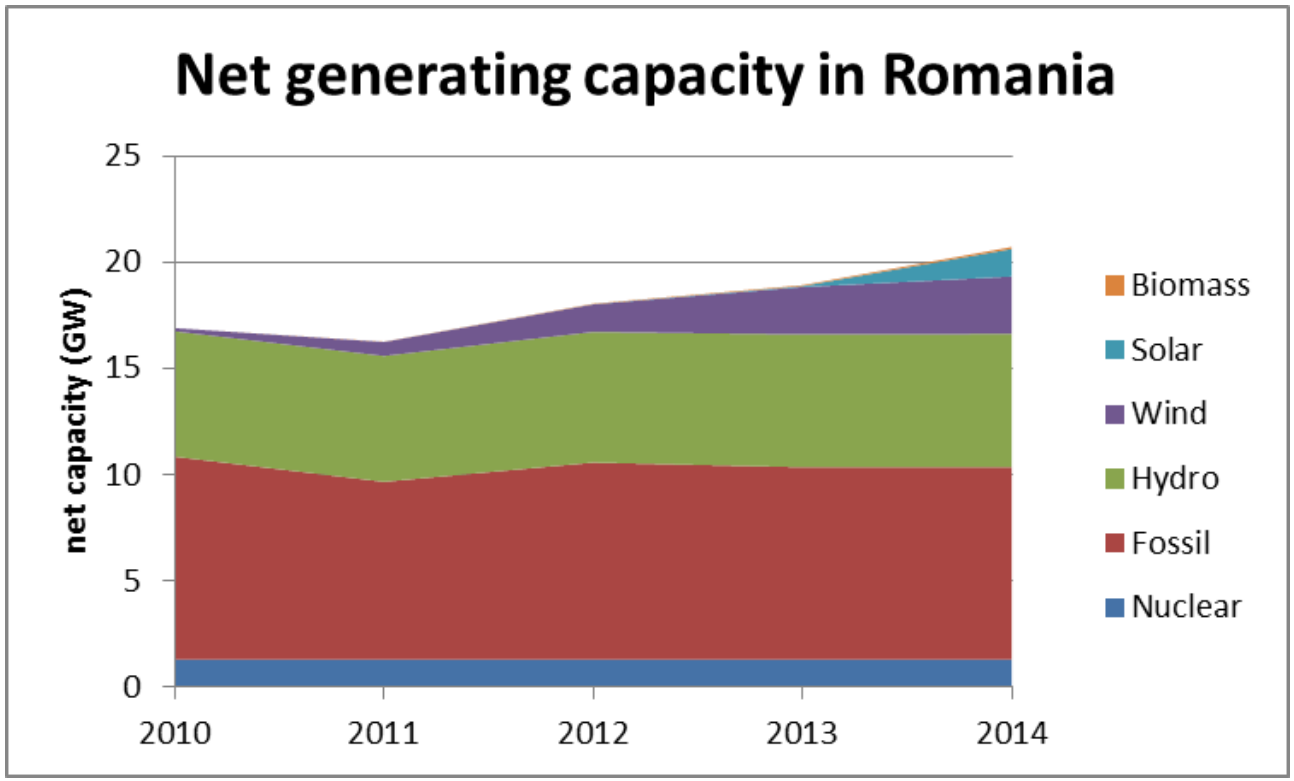
- Quota obligation defined as the % of gross final electricity consumption was increased in 2011 to match EU driven ambitions (2020 RES target)
- As of 2014 the quota is defined on an annual basis by the energy regulator ANRE and taking into account the national level of quota fulfilment and the estimated impact on the electricity prices for final consumers
- Goal: keep support level at 35 lei/MWh (7.8 EUR/MWh)

Year	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Old quota	0.7	2.2	3.74	5.26	6.78	8.3	8.3	8.3	9	10	10.8	12	13.2	14.4	15.6	16.8
Quota (2011)						8.3	10	12	14	15	16	17	18	19	19.5	20
RES-E share	*0.02*	*0.05*	*0.1*	*0.31*	*0.58*	*1.56*	*2.5*	*5.63*	*11.1*	*11.1*						
Quota (2014)										11.1	11.9	12.15				

Romania: RES-E capacity 2010-2014



MW	2010	2011	2012	2013	2014
Wind	150	660	1302	2235	2700
Solar	0	0	1	43	1300

Sources: Transelectrica

Romania: 2010 reform

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- The universal rule of 1 GC for each MWh has been differentiated according to technology favoring the more expensive solar (6 GC) and wind investments (2 then from 2018 1 GC). In addition, it differentiates among small hydro plants according to implicit efficiency (new versus refurbished).
- Price cap and price floor to mitigate the risk of producers and consumers (financing RES-E support)
- The original price range of 24-42 €/GC (until 2008) has been increased to 27-55 €/GC, yearly adjusted by ANRE according to the Eurozone inflation rate.
- The penalty increased from 63 €/GC (2005-2007) and 84 €/GC (2008-2010) to the current 110 €/GC.

Romania: support levels

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RES type	Type of electric unit / plant	Number of GC/ MWh	Support period (years)
1. Hydro energy – used in electric power plants with Pi ≤10 MW	new (commissioned after January 1st, 2004)	3 GC	15
	upgraded/ refurbished	2 GC	10
	commissioned prior to January 1st, 2004 and not upgraded	0.5 GC	3
2. Wind energy	new	2 GC until 2017	15
		1 GC as from 2018	
	second hand	2 GC until 2017	7
		1 GC as from 2018	
3. Biomass, biogas, bio liquids, geothermal energy	new	2 GC	15
	new – biomass from energy crops	3 GC	15
	high efficiency cogeneration (additionally to GC mentioned above)	1 additional GC	15
4. landfill gas, sludge fermentation gas in waste water treatment plants	new	1 GC	15
	high efficiency cogeneration (additionally to GC mentioned above)	1 additional GC	15
5. Solar energy	new	6 GC	15

Romania: Green Certificate price

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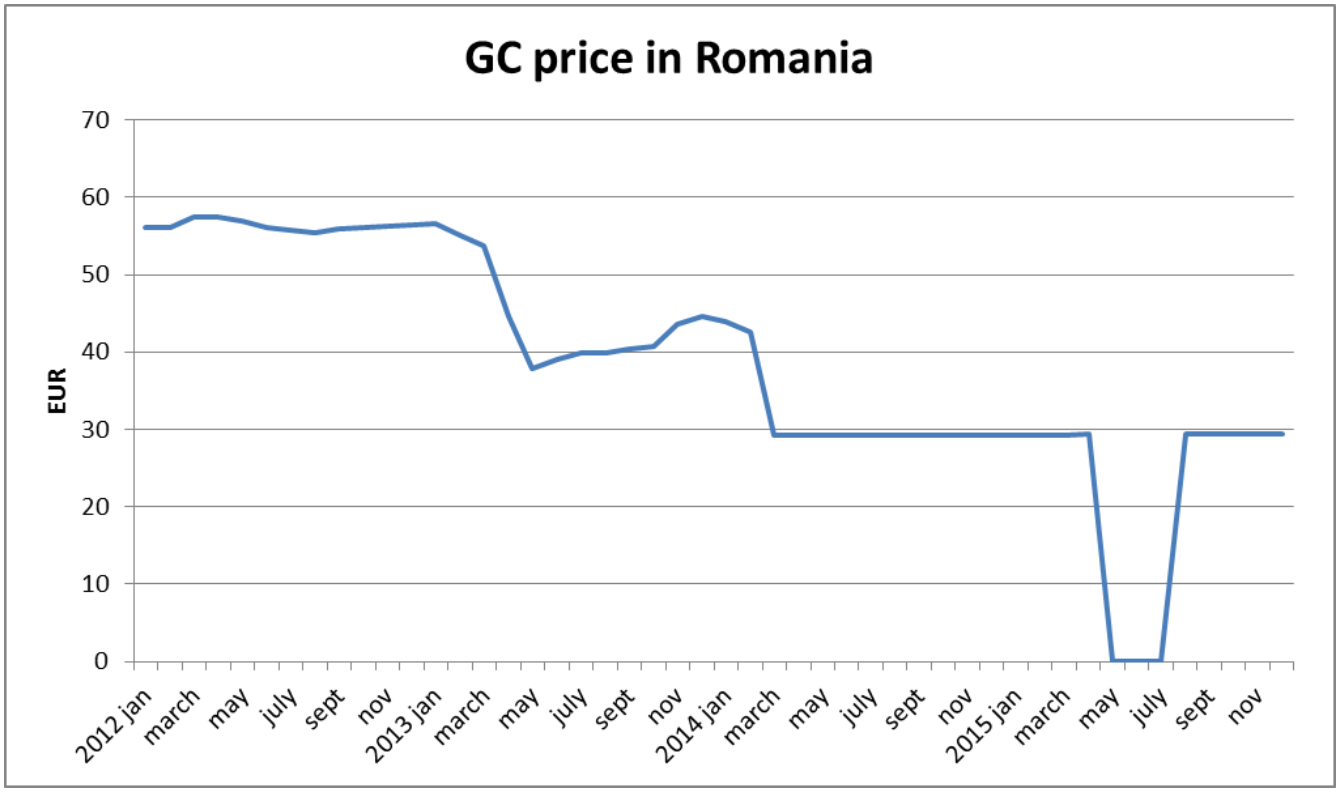

- Price ceiling until March 2013
- Price decrease: increasing RES-E supply
- From March 2014: price floor

Traded volumes:
2014: 2,675,000
2015: 36,618

Regulatory guarantees - 2012

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- Law No. 134/2012:
  - ANRE mandated to limit the number of GCs in case of overcompensation but only for NEW units
  - no reduction of green certificates before Jan. 1, 2014 for PV and Jan. 1, 2015 for other technologies
- ANRE overcompensation report: 2013 April
  - Wind, PV and small hydro receives too high support (compared to the 10% benchmark IRR)
  - No instant reduction was possible due to the law 134/2012

2013 revisions: reduction of GCs and deferral

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- Government's Urgent Ordinance No. 57/2013 (only after 1.5 years of operation!) - Deferring the allocation of GCs:
  - Wind: 1 out 2
  - PV: 2 out of 6
  - Hydro: 1 out of 3

  To be recovered in steps from…
  - Hydro and PV: March 2017
  - Wind: January 2018
- Government Decision No. 994/2013 - Reduction of quotas:
  - Hydro under 10MW: 3 to 2.3GC
  - Wind: 2/1 to 1.5/0.75 GC
  - Solar: 6 to 3

2013 revision

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- Cap on yearly new RES-E capacities benefiting from the GC system
- Once cap is reached, further capacity can queue for next year quota
- Prohibition of bilateral GC contracts: only centralized market can handle trade, coupled with the same regulation on electricity trade: no combined PPA contract for electricity and GC has negative impact on project bankability: high transaction cost for small RES producers
- Grid operators are entitled to require financial guarantees in order to issue grid connection permits for new RES-E capacities
- GCs are taxed prior to (and regardless of eventually) being sold

May 2015: New RES law

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- RES-E producers between 0.5MW and 3MW are exempt from trading electricity on OPCOM and may sell electricity through direct contracts.
- A feed-in-tariff scheme for RES-E producers under 500kW per unit will be introduced, still pending…
- The RES support scheme must be opened to imports from other Member States, as required by the EC.
- The GC system will not apply to electricity produced from RES at negative prices, also in accordance with EC requirements.
- Certain industrial companies (including fertilizer and steel production) will be exempt from paying the full value of GCs (40-85%) for the next 10 years (Government Decision 495/2014). Funding collected through sanctions for non-compliance and derogation from full price must be invested to energy efficiency projects.

May 2015: New RES law

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- This leaves a gap of approximately €750m over 10 years to be paid by households and SMEs.
- However, the effective exemptions are to follow upon the Energy Ministry's approval of individual exemption agreement.
- According to ANRE estimates, the impact of GCs in end-users' bills will grow from Lei 35/MWh to Lei 43/MWh under the new quota.
- End-user bills, however, are expected to decrease by up to 5% next year on account of a separate ANRE order open for public debate, which slashes distribution tariffs as of 1 January 2016 by 5.5-16.3%: DSOs have threatened to sue.

RES-E support: cost limiting techniques

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Focus	Forms	Variations
Eligibility	technology specific	
	size	
	Vintage	
Eligibility period	IRR based	
	technology specific	
	vintage	
	equipment status	
FIT level	degression	entry FIT level
		during the eligibility period
	unplanned cut	
	taxation	
	auctioning	
	subtraction of investment subsidy	
Cap	capacity	
	volume of electricity	
	Budget	
Target	reduction of target amounts	

EU State Aid Guidelines, 2014

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- From 1st January 2016, public support for RES-E production can only be provided in the form of market-oriented mechanisms, such as premiums (a top-up on the market price) or tradable certificates.
- RES-E producers are required to sell the electricity in the market.
- RES-E producers are subject to balancing responsibilities (i.e., an obligation on producers to compensate for short-term deviations from their previous delivery commitments).
- Feed-in tariffs can only continue for small installations (less than 500 kW; wind energy up to 3 MW or 3 generation units) and for demonstration projects.
- An aid scheme can be authorised for maximum 10 years, after which it should be re-notified.

EU State Aid Guidelines, 2014

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- The Guidelines gradually introduces competitive bidding processes (tenders) for the allocation of public support above1 MW (above 6 MW or 6 wind units):
  - In 2015 and 2016, at least 5 % of the planned new electricity capacity must be granted in competitive bidding processes
  - From 1 January 2017 all aid must be auctioned, except where the Member State can demonstrate that only one or a very limited number of projects or sites could be eligible, or a competitive bidding process would lead to higher support levels, or a competitive bidding process would result in low project realization rates.
- These procedures shall be based on clear, transparent and non- discriminatory criteria. The bidding process must be open to all generators producing electricity from renewable energy sources.

Why tendering?

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- avoid over- or undercompensation (by market-based price discovery)
- avoid uncontrolled open-ended support (by budget capping)
- no need to define mature vs non-mature (by a self-regulating support phase-out)

Eight EU Member States have already implemented auction schemes: Denmark, France, Germany, Ireland, Italy, Netherlands, Portugal, UK

Operational support for existing biomass plants

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- biomass fired power plants are characterized by high operating (fuel) cost and in the absence of support these capacities could be shut down before the end of their lifetime
- Aid can be provided even after depreciation if the MS proves that the average cost exceeds market price and the use of biomass is more expensive than fossil fuels (technology option to choose between the two)
- Support cannot be more than the difference between the operating costs and the market price (or the price of the alternative fossil fuel)
- the cost development must be monitored and support rate must be adjusted annually

Tender design

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- Technology neutral or specific: Cost effectiveness versus diversification?
- The Guidelines allows for technology specific tenders if neutral tender would lead to a suboptimal result which cannot be addressed in the process design such as:
  - the longer-term potential of a given new and innovative technology,
  - the need to achieve diversification,
  - network constraints and grid stability,
  - system (integration) costs, or
  - the need to avoid distortions on the raw material markets from biomass support.

Tender design

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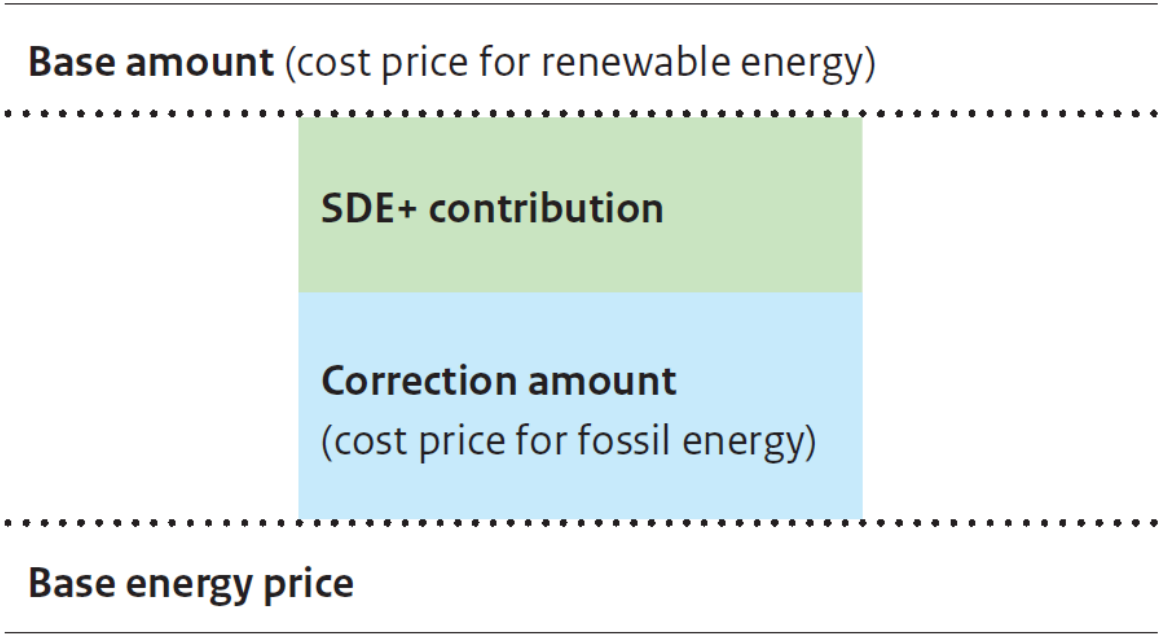
- Uniform price or pay-as-bid
- Pre-qualification requirements: high upfront cost can inhibit smaller players to enter the auctions but no such requirements can attract non-serious investors (leading to low rate of project execution), „bid bond”
- Evaluation criteria: only price or other considerations (employment effect, local component, geographical preferences etc.)
- Compliance issues: deadline for operation date, milestones in project development, „compliance bond”
- Regularity of auctions

Auctioning for support: The Netherlands (SDE scheme)

- Compensates for the difference between fossil and renewable based energy generation cost (feed-in premium)
- Financed from the treasury (general taxes)
- Maximized but increasing annual budget: 2013 3 bn EUR, 2015: 3.5 bn EUR, 2016: 8 bn EUR
- Joint budget for all supported RES technologies (covering RES-E, RES heat, RES heat CHP and RES gas)
- Eligibility period depends on the technology:
  - Biogas: 12 years
  - Waste incineration: 5 years
  - Most technologies: 15 years

SDE+ scheme



- SDE+ contribution depends on the market price
- Base energy price: price floor
- Base amount: price cap
- Final subsidy payment is calculated per year based on the amount of produced energy and energy price

SDE+ scheme 2015

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technology		phase 1	phase 2	phase 3	phase 4	phase 5	phase 6	phase 7	phase 8	phase 9
PV	*under 15 kW*	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.141
wind		0.0875 (2800)	0.1 (2160)	0.1125 (1840)	0.119 (1760)	0.119 (1760)	0.119 (1760)	0.119 (1760)	0.119 (1760)	0.119 (1760)
hydro	*new*	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.15
biomass CHP	*under 10 MW*	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.14	0.144
manure fermentation		0.055	0.063	0.071	0.077	0.077	0.077	0.077	0.077	0.077
geothermal CHP	*more than 500 m deep (max. 178 GJ/year)*	0.07	0.08	0.09	0.098	0.098	0.098	0.098	0.098	0.098
geothermal heat	*more than 500 m deep*	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052	0.052
solar thermal	*surface area more than 100 m2*	0.07	0.08	0.09	0.1	0.11	0.12	0.13	0.137	0.137

- 9 phases per year
- subsidy increases per phase
- Risk of budget shortage in case of later phases

Regulatory lessons

Regulatory lessons

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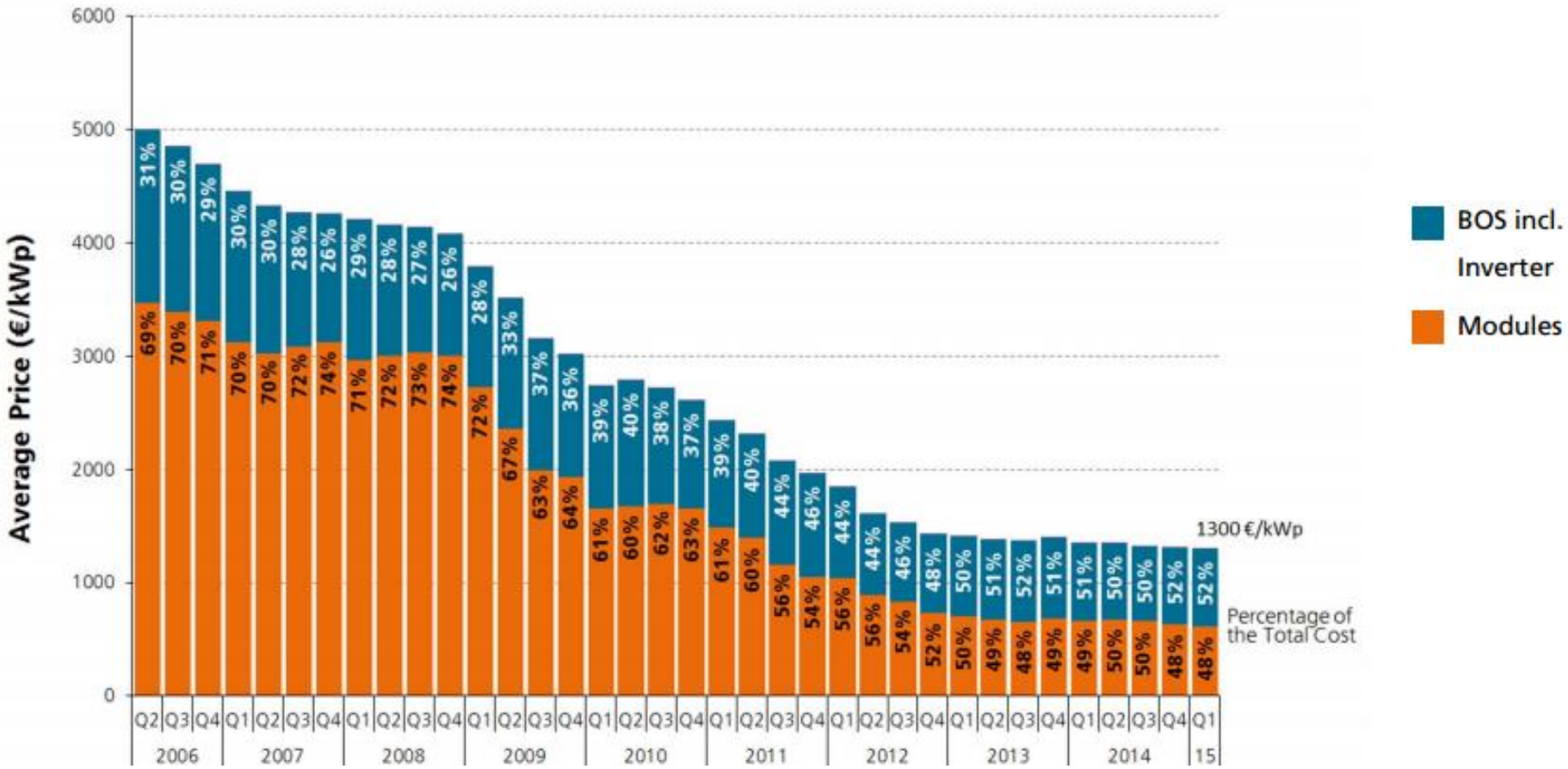
- Policy should quickly react to technological development (most notably PV)
- Dilemma: early move versus conservative deployment
- Overshooting (PV) support level is a serious regulatory failure:
  - Price effect
  - Initiates unplanned regulatory changes – reduce system credibility
  - Reduce support efficiency: crowds out other RES-E technologies
  - Often induces secondary license permit market (due to grid limitations)

Average price for PV rooftop systems in Germany (10-100kWp)



Source: Fraunhofer, 2015

Regulatory lessons

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- Normative limiting techniques are preferable to ad hoc and ex post adjustments
  - Germany: „capacity corridor”
  - The Netherlands: annual budget cap with decreasing FIP
- Support reduction decisions must be taken in a transparent and predictable way that gives proper time to RES industries to react and adapt
- Strong mandate of the independent regulator authority is essential for RES-E deployment
- RES-E tenders are to be phased in gradually (learning by doing)
- Coordination between bidding and network access permits is essential

Thank you for your attention!

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- Country RES electricity targets (from NREAP) and present deployment level, trends
- Is there any target beyond 2020 for RES electricity? (e.g. in national strategic documents)

- RES electricity support scheme: type of support (Focusing on operational support: FIT, FIP other, so disregard investment support),
- Level of support by technologies (PV, wind, biomass, hydro etc.) in Euro. Indicate source of information.

- RES integration issues
  - Network regulation – connection rules, contribution to network costs (deep vs shallow)
  - Balancing requirements (if different from conventional capacities)

- Who is paying for the RES support?
- Is there any support budget exist? Is it capped?
- Any cap exists for any RES technology?

- Key barriers and success factors if exists
- Did any significant change occur in the RES regulation in the last years?