ENERGY REGULATORY OFFICE

Renewable Energy Support Schemes

National Association of Regulatory Utility Commissioners
Energy Regulatory Partnership Program
Energy Regulatory Office and Illinois Commerce Commission
Third Partnership Activity

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Presentation Structure

1. Definition of RES
2. Renewables Legal Basis
3. Indicative Targets
4. Price vs. Quantity Based Support Schemes
5. Marginal Cost Curves of RES Technologies
6. Aggregate Marginal Cost Curve
7. Authorized Capacity to meet RES

Renewable Energy Sources (RES)

- **Defined by Law on Energy as** *"renewable non-fossil energy sources (wind, solar, geothermal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogases)"*
- **Definition is in accordance with Directives 2003/54/EC and 2001/77/EC**

Legal Basis (1/2)

- **International obligations**
  - **Kosovo is a signatory party of the Energy Community Treaty**
  - **Kosovo is therefore obliged to comply with EC Directives (**with respect to renewable energy, Directives 2003/54/EC, 2001/77/EC and 2009/28/EC**)**
- **Primary legislation (issued by the National Assembly)**
  - **Law on Energy No. 2004/8**
    - **Article 10: "***The Ministry responsible for Energy shall prepare proposals for incentives of the efficient use of Energy and RES*"
    - **Article 12**: "*The Ministry responsible for Energy shall each year establish Indicative targets for consumption of electricity from RES…"*
  - **MEM Administrative Instruction 06/2007 -** Sets forth the Indicative Targets of Electricity to be consumed from Renewable Energy Sources

Legal Basis (2/2)

- **Secondary legislation (issued by ERO)**
  - **Rule on support of electricity produced from Renewable Energy Sources –** Determines the capacity, the hours of production and the price of renewable energy which is to be consumed for meeting the Indicative Targets set forth by the Ministry of Energy and Mining (MEM).
  - **Rule on Authorization Procedure of New Generating Capacities –** Establishes the procedure for authorization of projects for construction of new generating capacity by setting forth the criteria related to the issuance of authorizations.
  - **Rule on Certificates of Origin –** Sets out the provisions concerning the setting up, operation and maintenance of a system managed by ERO for the Issuance, Transfer, Redemption and Revocation/Cancellation of Certificates of Origin with reference to electricity produced from Renewable Energy Sources.

Administrative Instruction 06/2007

- **The Indicative Targets for the consumption of electricity from RES, determined by the MEM (GWh):**

Energy Source	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Hydro	125.84	134.56	145.03	156.31	167.01	178.40	190.50	203.18	216.67	230.39
Wind	0.00	0.00	0.00	32.56	68.73	108.51	151.89	199.80	252.14	309.94
Solar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biomass	0.00	0.00	0.00	0.00	11.63	17.45	19.77	23.26	29.08	29.08
Total	**125.84**	**134.56**	**145.03**	**188.87**	**247.37**	**304.36**	**362.16**	**426.24**	**497.88**	**569.40**

Support Schemes: Price-Based

- **Feed-in tariffs.** RES-E is sold to the network operator (or another identified buyer) at an administratively-set price (typically higher than the wholesale electricity price). A feed-in tariff is paid for a predefined period (10-15 years)
- **Price premia.** RES-E is entitled to receive an additional price component, which is typically set administratively, in addition to the electricity price that it can obtain in the market. The premium system has historically been considered as a kind of feed-in tariff. A price premium is paid for a predefined period (10-15 years)
- **Investment subsidies.** A financial subsidy is granted to investors developing RES-E capacity. These mechanisms include capital grants, third-party financing, consumers grants and rebates, among many others alternatives.
- **Fiscal incentives.** Fiscal rebates are granted on investment in RES-E capacity, or on the energy produced. These mechanisms include tax credits, excise and property tax exemptions, and/or many other similar alternatives.
- **Fossil fuel taxes.** Carbon taxes or taxes on other pollutants, such as SOx and NOx, are imposed on the use of fossil fuels. This can indirectly benefit RES-E by reducing their relative prices in comparison with those of electricity produced from fossil fuels.

Support Schemes: Quantity-based

- **RES quota obligations and tradable (Green) certificates.** Green certificates are issued in respect to RES-E production and represent the "renewable value" of such production. An obligation to produce or consume a specified minimum proportion of RES-E is imposed on generators or consumers. The obligation may be fulfilled directly or by acquiring green certificates. Green certificates are typically issued to new RES-E plants for a pre-specified period, typically 10 to 15 years.
- **Tendering procedures.** The state or the regulatory authority organises competitive tender procedures for the supply of RES-E, which is then supplied on a contract basis at the price resulting from the tender. Usually, auctions are structured in such a way that a certain amount of additional RES-E capacity is put out to tender with bids being selected on the basis of the offered price.

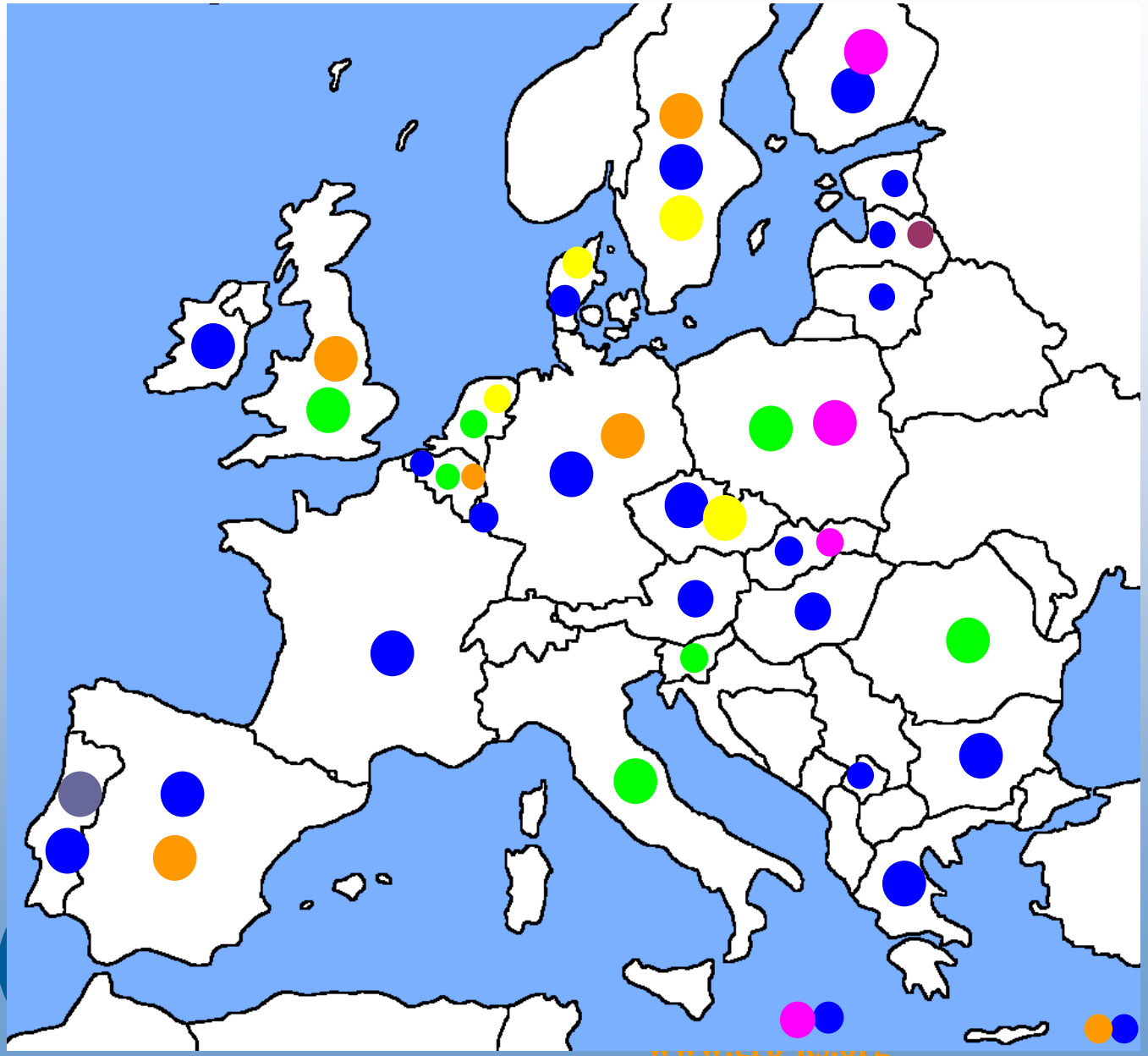
Summary Assessment of RES Support Mechanisms (1/2)

Policy Instrument	Advantages	Disadvantages
Feed-in tariffs	1. Highly effective 2. Highly efficient due to the low risk for investors 3. Permit strategic support for technology innovation	4. Low compatibility with liberalised markets 5. Need regular adjustment 6. May overcompensate investors
Price premiums	7. Highly effective 8. Efficient due to the medium risk for investors 9. Good compatibility with liberalised markets 10. Permits strategic support for technology innovation	11. Risk of over-compensation in the case of high electricity prices without appropriate adjustment

Summary Assessment of RES Support Mechanisms (2/2)

Policy Instrument	Advantages	Disadvantages
Investment subsidy	1. Good complement for some technologies	2. Inefficient as a main instrument
Fiscal measures	3. Good secondary instrument	4. Good results only in countries with high taxation and for the most competitive technologies
Fossil fuel taxes	5. Mimic the social price of conventional energy, promoting energy portfolio optimisation	6. At the market outset, inframarginal windfall profit difficult to assess
Green certificates	7. Good compatibility with liberalised markets 8. Promote competition between generators 9. Support the lowest-cost technologies	10. Less efficient due to higher risks and administrative costs; better designs can overcome this drawback 11. Not very appropriate for developing medium- to long-term technologies
Tendering procedures	12. Fast development, provided political will 13. Very good tool for kick-starting policies	14. Stop-and-go nature can cause instabilities 15. Development blocked if competition too severe

RES-E Support Mechanisms



- Feed-in tariffs (22)
- Green certificates (7)
- Inv subsidies (7)
- Mandatory quota (1)
- Tendering proced (1)
- Tax exemption (4)
- Tariff premia (4)

Medium-Term Marginal Cost Curves for SHPP and Wind

Figure 7: Small Hydro-based Power Supply Curve

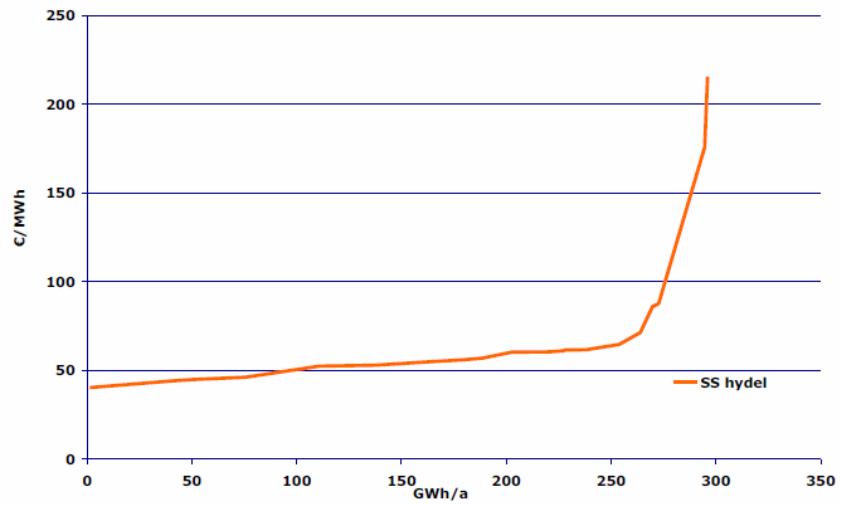
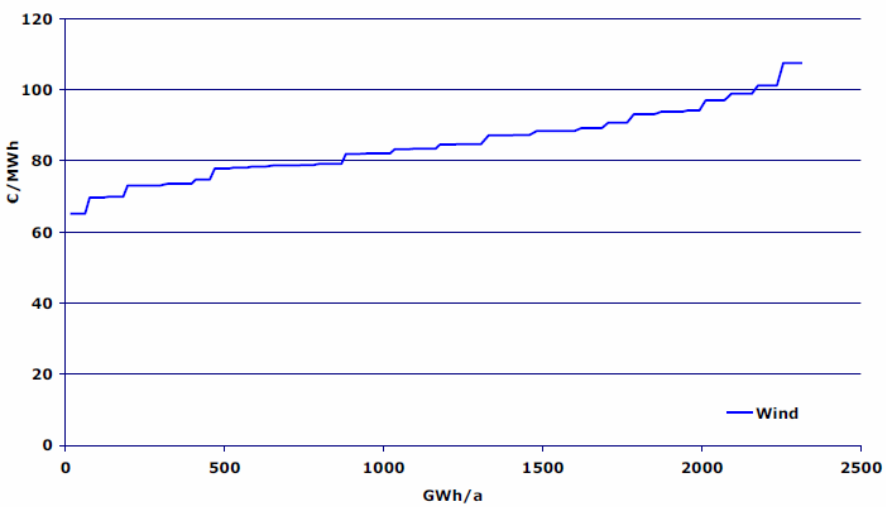


Figure 9: On-shore Wind-based Power Supply Curve



Medium-Term Marginal Cost Curves for Photovoltaic and Biogas technologies

Figure 11: PV-based Power Supply Curve

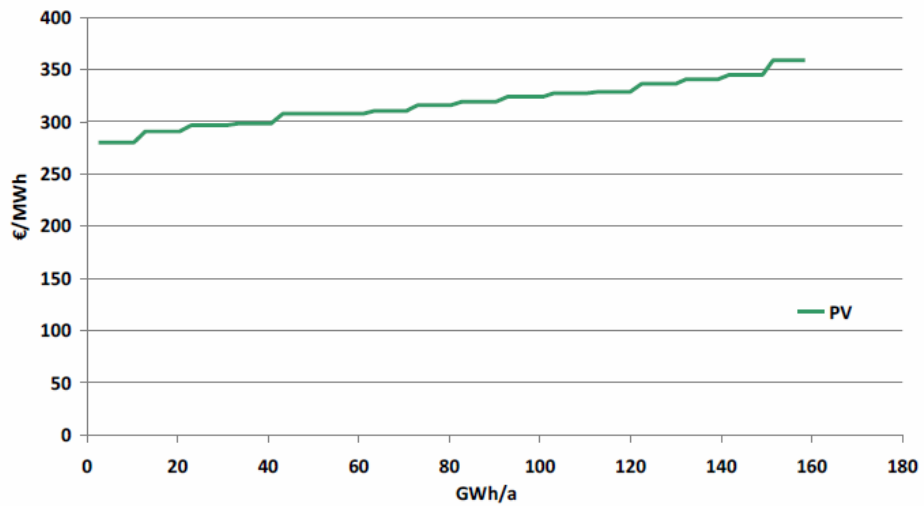
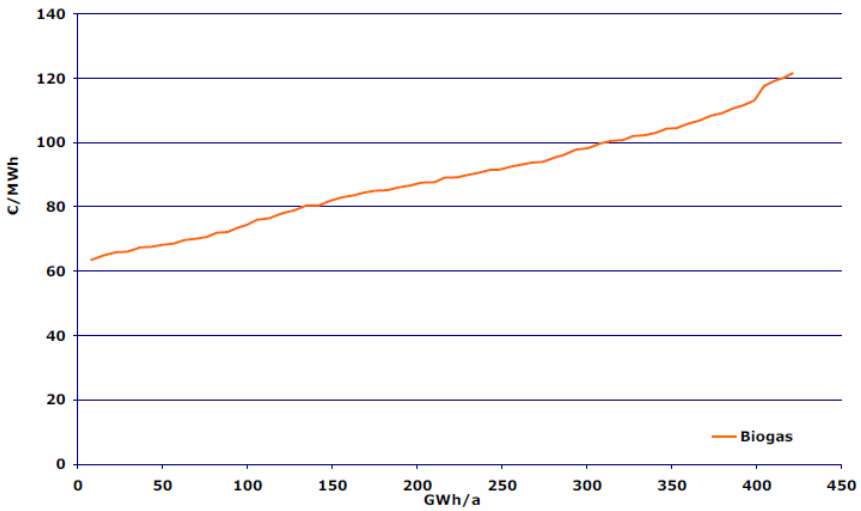
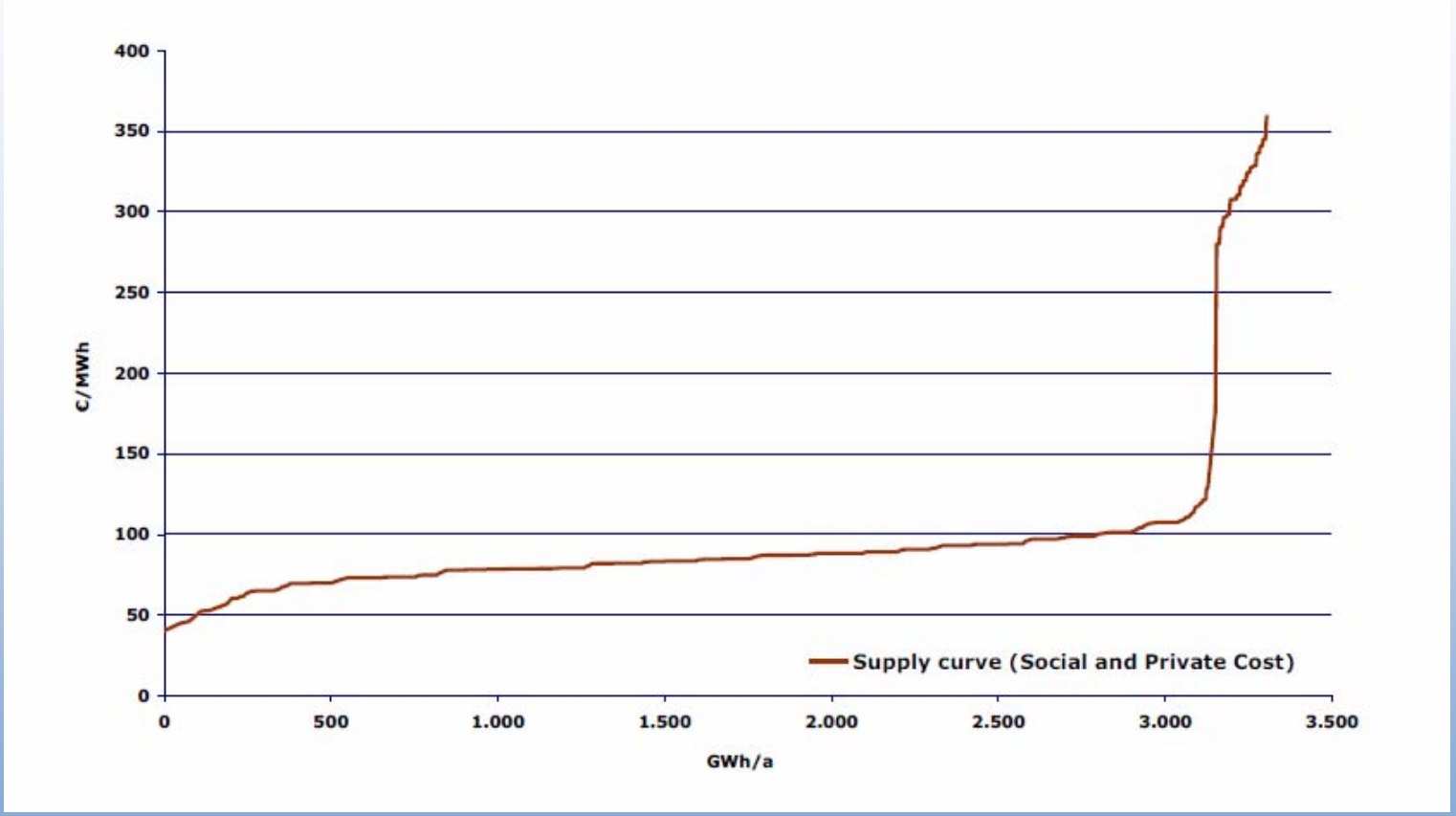


Figure 12: Biogas based Power Supply Curve



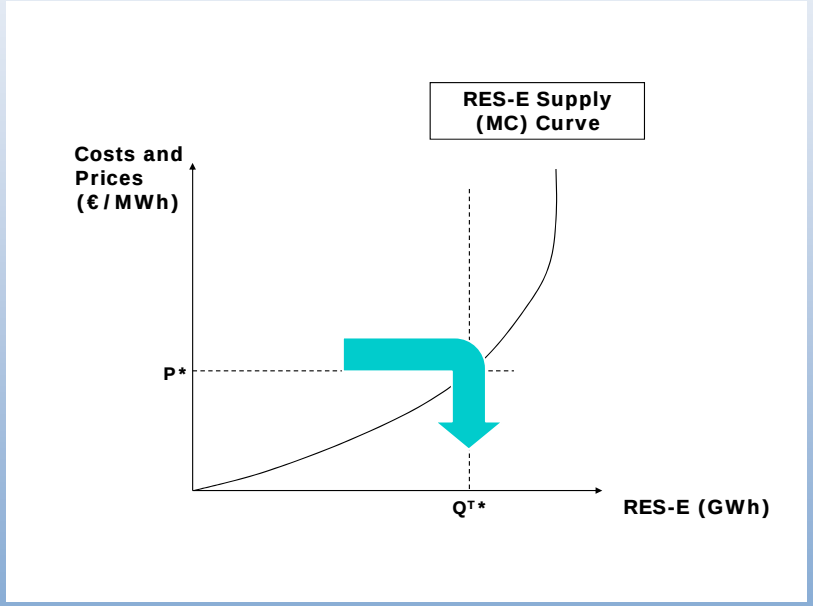
Aggregate Marginal Cost/Supply Curve for all RES Technologies



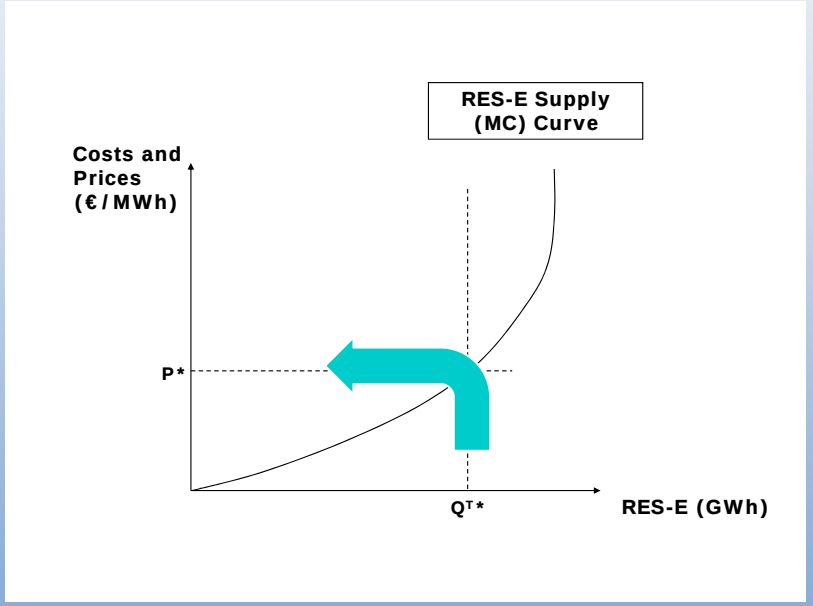
Price Based vs. Quantity Based Mechanisms (1/2)

Under Perfect and Complete Information about costs and behaviour

Price-based Mechanism (e.g. Feed-in Tariffs)



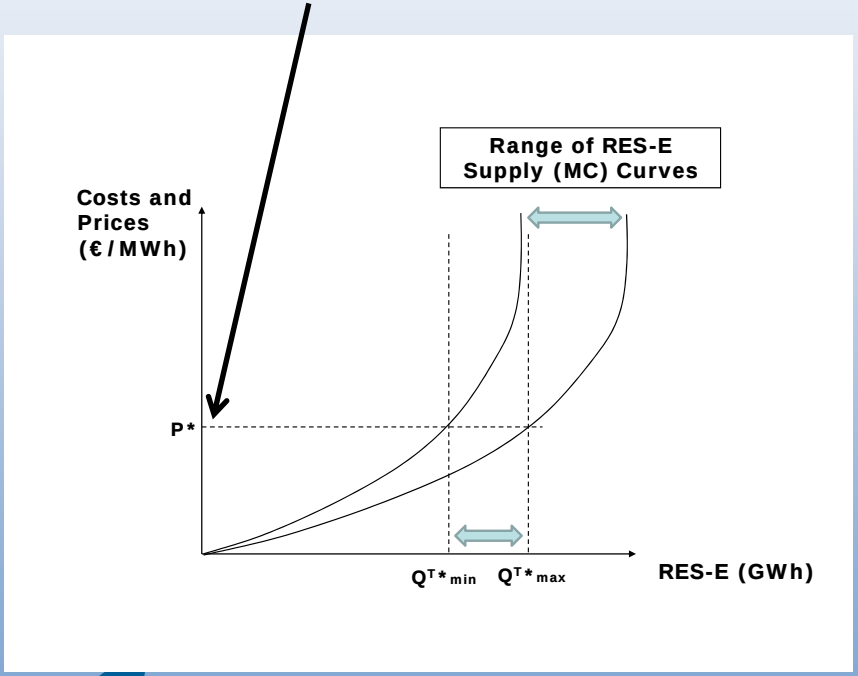
Quantity-based Mechanism (e.g. RES Quota and TGC)



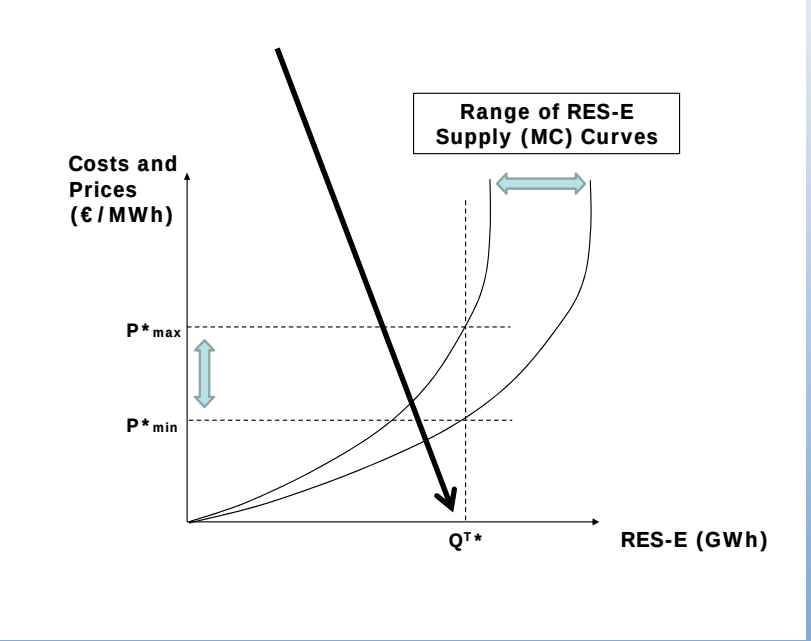
Price-based vs Quantity-based Mechanisms (2/2)

Under Imperfect Information about costs and behaviour

Price-based Mechanism (e.g. Feed-in Tariffs)



Quantity-based Mechanism (e.g. RES Quota and TGC)



With incomplete/imperfect information, Price-based Mechanisms and Quantity-based Mechanisms have different properties

Capacity to be Authorized

- **Law on Electricity 2004/10 Article 10.3 –** "*Public Suppliers shall give purchasing priority to RES producers, provided that the cost of such electricity does not increase the price of electricity to an unsustainable level…*"
- **Rule on Support of Electricity produced from RES –** determines the authorized capacity to be supported with the support scheme but also puts a limit on the amount of energy which can be purchased with the FIT (all necessary energy up to the Indicative Target)

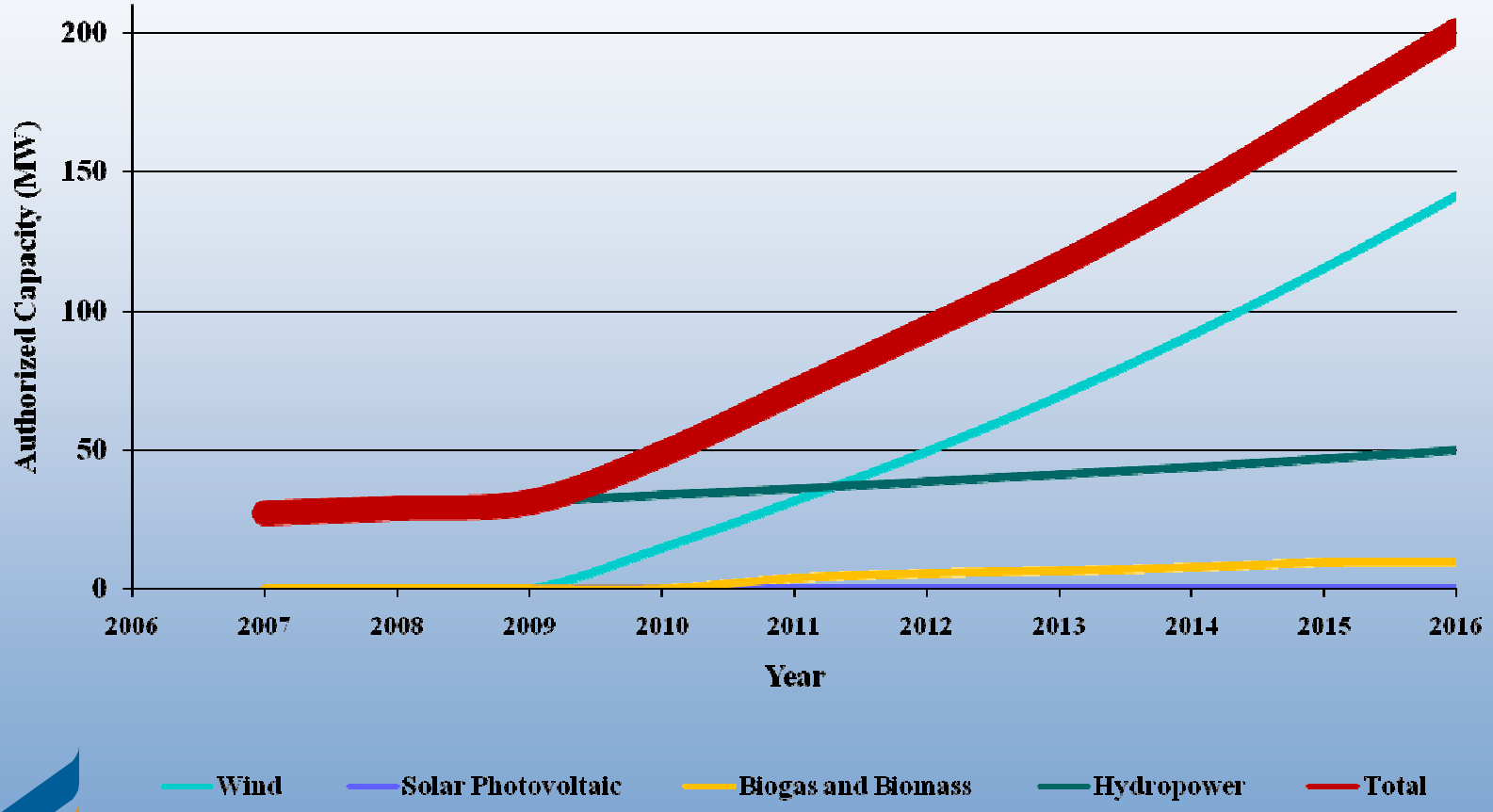
Primary Renewable Energy Source:	Installed Capacity (MW)***									
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Hydropower	27.1	28.9	31.2	33.6	35.9	38.4	41.0	43.7	46.7	49.6
Wind	0	0	0	14.8	31.3	49.5	69.3	91.2	115.1	141.5
Solar Photovoltaic	0	0	0	0	0	0	0	0	0	0
Biogas and Biomass	0	0	0	0	3.7	5.6	6.4	7.5	9.4	9.5

*** Capacity is determined by dividing the volume of energy in the Indicative Targets, by the average hours of work (assumed Capacity Factor) for each technology

*** These figures are rough **estimations** only. Final numbers will be published pending a Board decision

*** Assumed CFs: sHPP (53%), Wind (25%), Biomass (35%)

Capacity to be Authorized



*** Assumed CFs: sHPP (53%), Wind (25%), Biomass (35%)

Main Structure of the Support Scheme (1/2)

- The Indicative Targets set by MEM define the quantitative scope of the Support Scheme
- ERO to define the level of capacity for the different RES-E technologies required to achieve the Indicative Targets (in 2020 or nearest year)
- Participation in the Support Scheme is voluntary: alternatively, RES-E can be sold on the market
- RES-E producers can apply to be admitted to the Support Scheme for RES-E with respect to which Certificates of Origin have been issued (even though CoOs are not Support instruments)
- Admission on a first-come-first-served basis, including for new plants which are given a maximum period for entering into operation

Main Structure of the Support Scheme (2/2)

- **RES-E producers admitted to the Support Scheme should post a (bank) guarantee to commit to:**
  - **Produce RES-E (at least 50% of maximum production over any two years)**
  - **For new plants, to enter into operation within the date specified by ERO**
- **Admitted RES-E producers enter into a PPA (5+5 years) with the Public Supplier, at prices defined by ERO**
- **Non-admitted RES-E producers:**
  - **are kept on stand-by for admission for the entire life of the plant (or 3 years for new plants)**
  - **can sell RES-E at a price equal to the avoided costs of equivalent purchases by the Public Supplier [from public generators].**

Main Requirements for Admission to the Support Scheme

- Location: generating unit should be located within Kosovo
- Technological: generating unit technology should be among those for which RES-E indicative penetration targets are established by MEM
- Capacity: the generating unit capacity should “fit” within the technology-specific capacity level defined by ERO to fulfill the indicative targets
- The Feed-in Tariff can only be paid if CoOs are issued on the same electricity, which in turn requires:
- Electricity being produced by RES, waste or in CHP plant
- Generating unit being equipped with appropriate metering device(s) (which can also measure consumption of auxiliaries

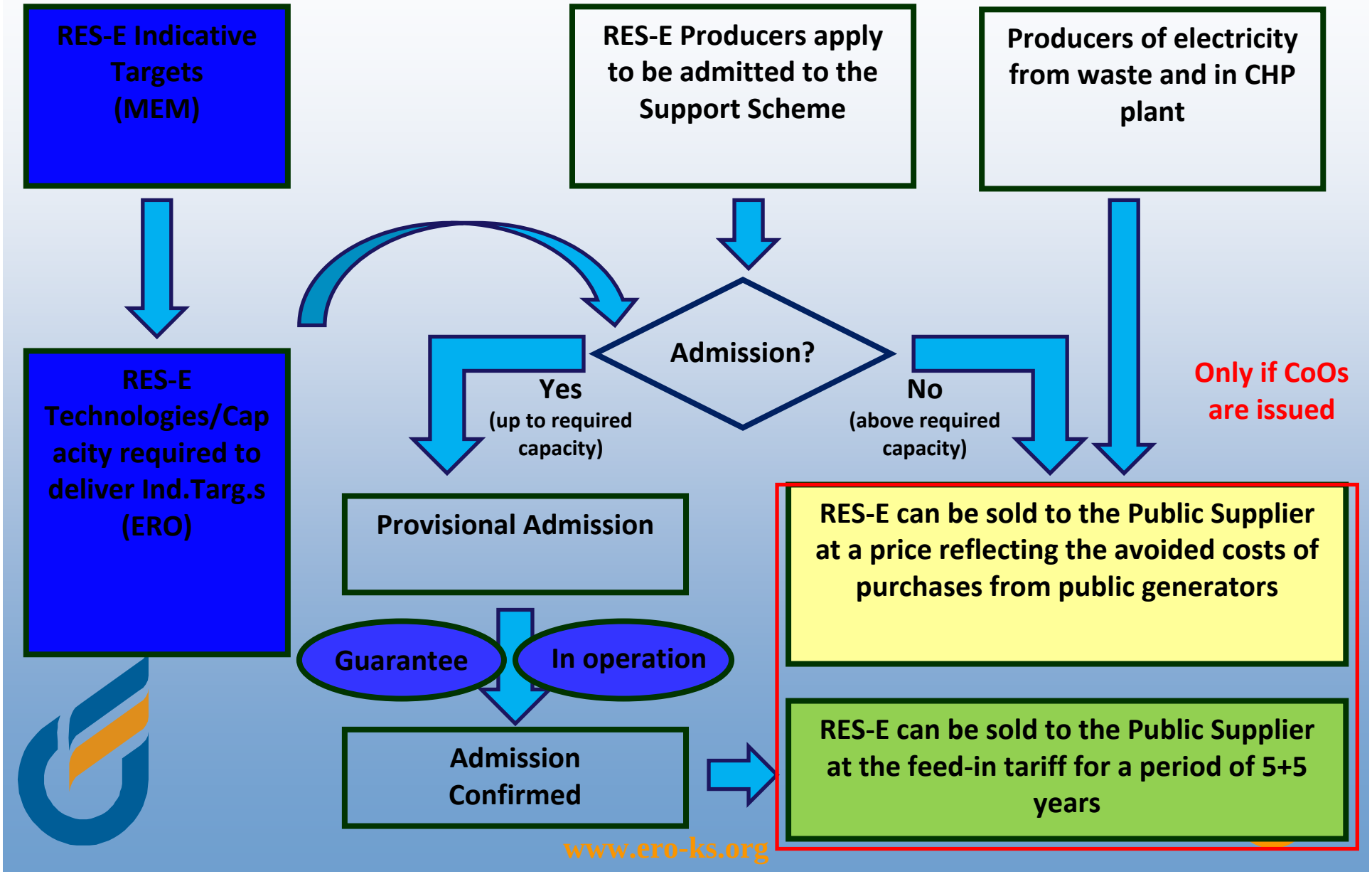
How to be Admitted to the Support Scheme (1/2)

- Apply for the generating unit to be admitted to the support scheme
  - Main requirements
    - Generating unit located in Kosovo
    - Generating unit technology among those for which Indicative penetration Targets are defined by MEM
    - Generating unit capacity “fits” into the technology-specific generation capacity defined by ERO as necessary to achieve the Indicative Targets
    - (Generating unit issued with CoOs)
- If requirements are met, the generating unit is Provisionally Admitted to the Support Scheme, pending:
    - The posting of a bank guarantee
    - (for new generating unit) the entry into operation by the date set by ERO

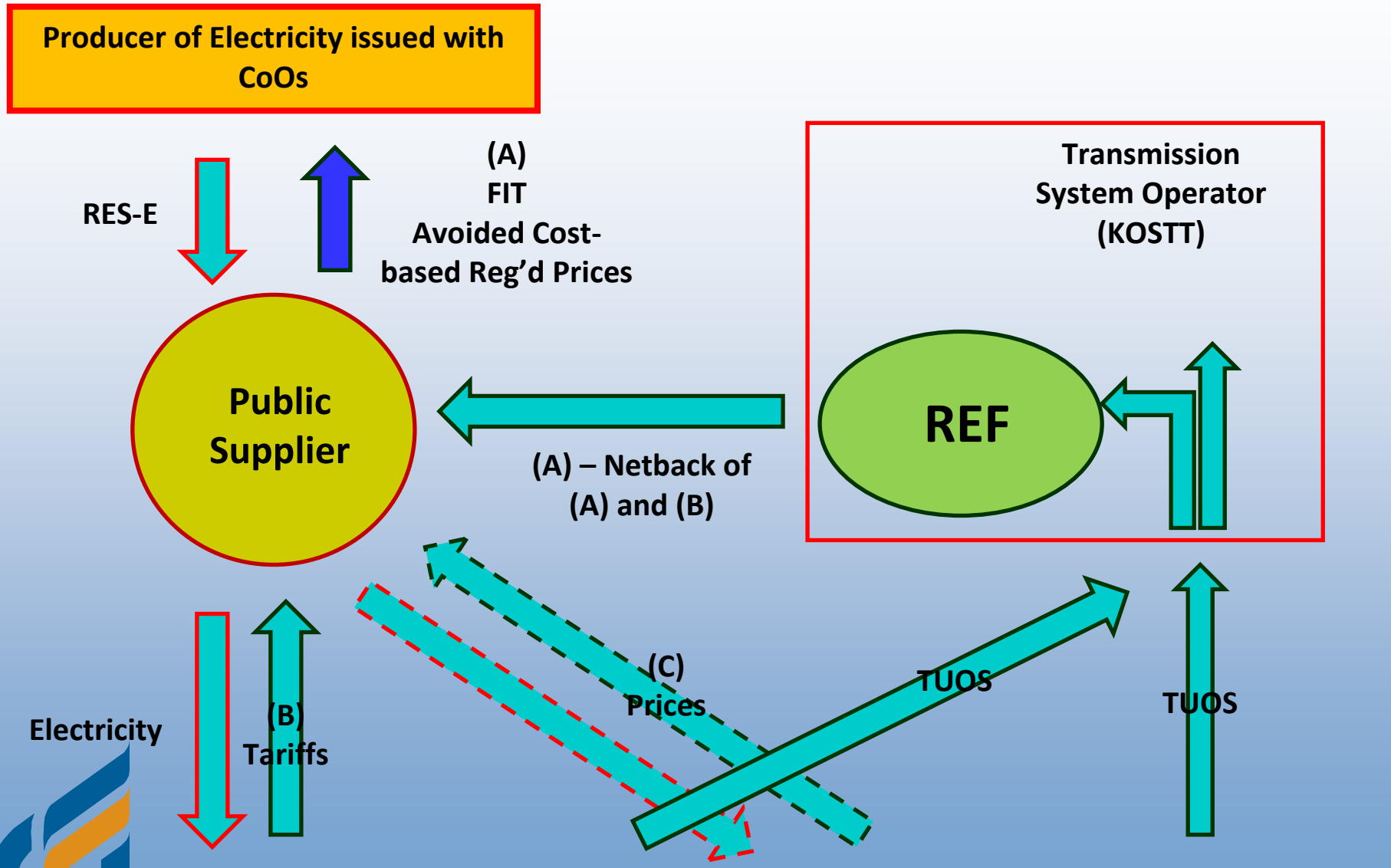
How to be Admitted to the Support Scheme (2/2)

- Once the above conditions are met, Admission of the generating unit to the Support Scheme is confirmed and a PPA is concluded with the Public Supplier:
  - Duration: 5+5 years
  - Prices: Feed-in Tariff defined by ERO
- The Feed-in Tariff can only be paid on electricity in relation to which CoOs have been issues

The Support Scheme at a Glance



The Renewable Energy Fund



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Thank you!