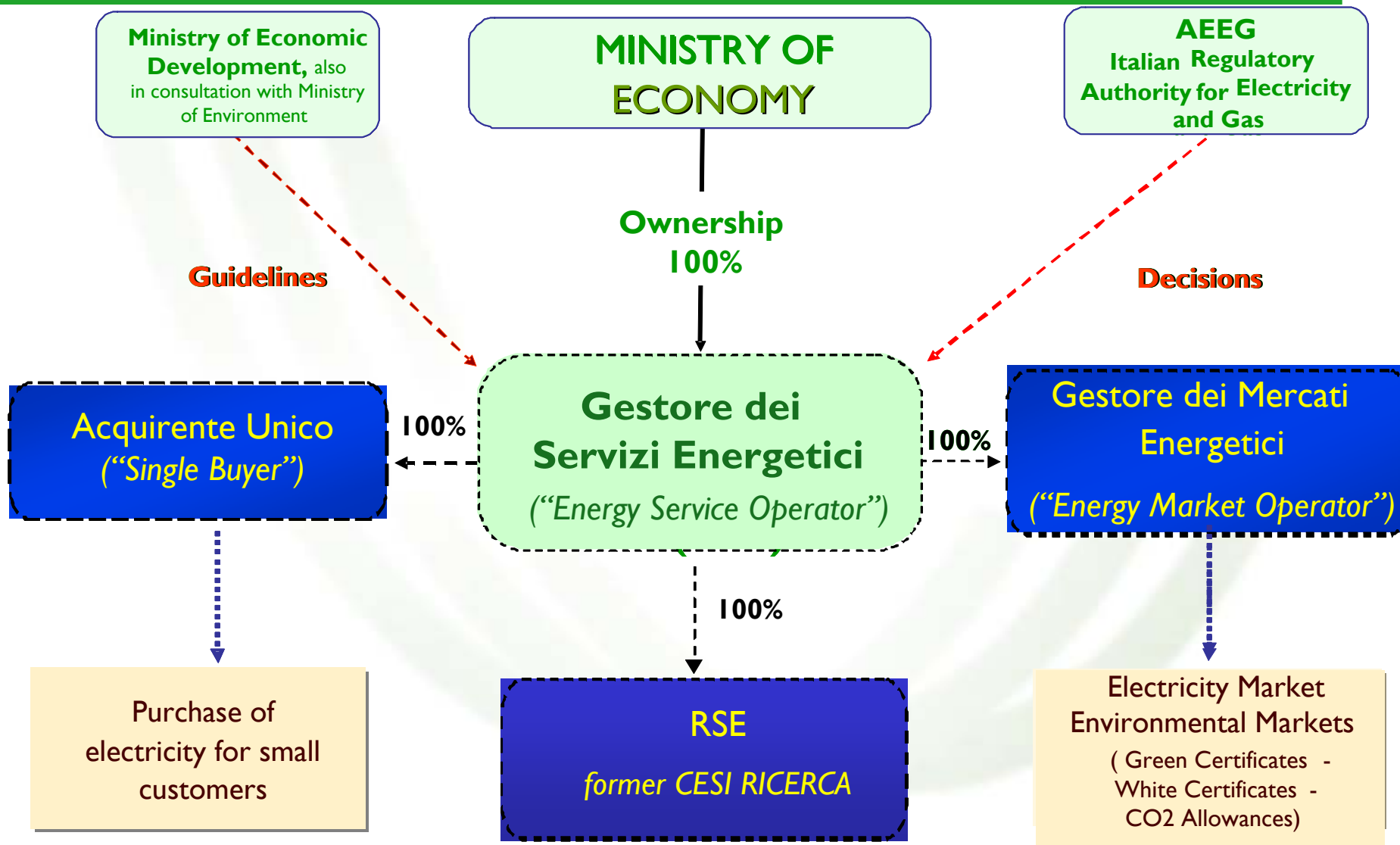




Preliminary study for the development of the ELMED project in Tunisia

Analysis of the Tunisian institutional, regulatory and legal framework required for applying article 9 of Directive 2009/28/EC

- **GSE – Energy Services Operator**
- **ELMED project: Analysis of the Tunisian institutional, regulatory and legal framework required for applying article 9 of Directive 2009/28/EC**



GSE – Energy Services Operator



GSE – Energy Services Operator promotes the development of renewable energies sources by:

- Support mechanisms for the production of renewable energies;
- Organising awareness campaigns on environmentally-sustainable and responsible use of electricity.
- Energy Consultancy to Public Administration

GSE main activities

- Incentivizing small renewable energy power plants by the **feed-in tariff** (Tariffa omnicomprensiva);
- Qualifying RES-E plants (**IAFR**) and co-generation plants;
- Issuing Green Certificates (“**CV**”) and monitoring producers and importers compliance with the related obligations;
- Implementing body of the process of **fuel mix disclosure**
- Issuing the Guarantee of Origin (**GO**) of electricity generated by RES or high-efficiency (CHP) plants;
- Issuing RECS (Renewable Energy Certificate System) certificates;
- Managing support schemes (**Feed-in-premium**) for electricity generation by PV and thermodynamic solar plants (“**Conto Energia**”)
- Participating in the international associations such as **IEA** (International Energy Agency), **OME** (Observatoire Méditerranéen de l’Energie) and **AIB** (Association of Issuing Bodies).

- **GSE – Energy Services Operator**
- **ELMED project: Analysis of the Tunisian institutional, regulatory and legal framework required for applying article 9 of Directive 2009/28/EC**

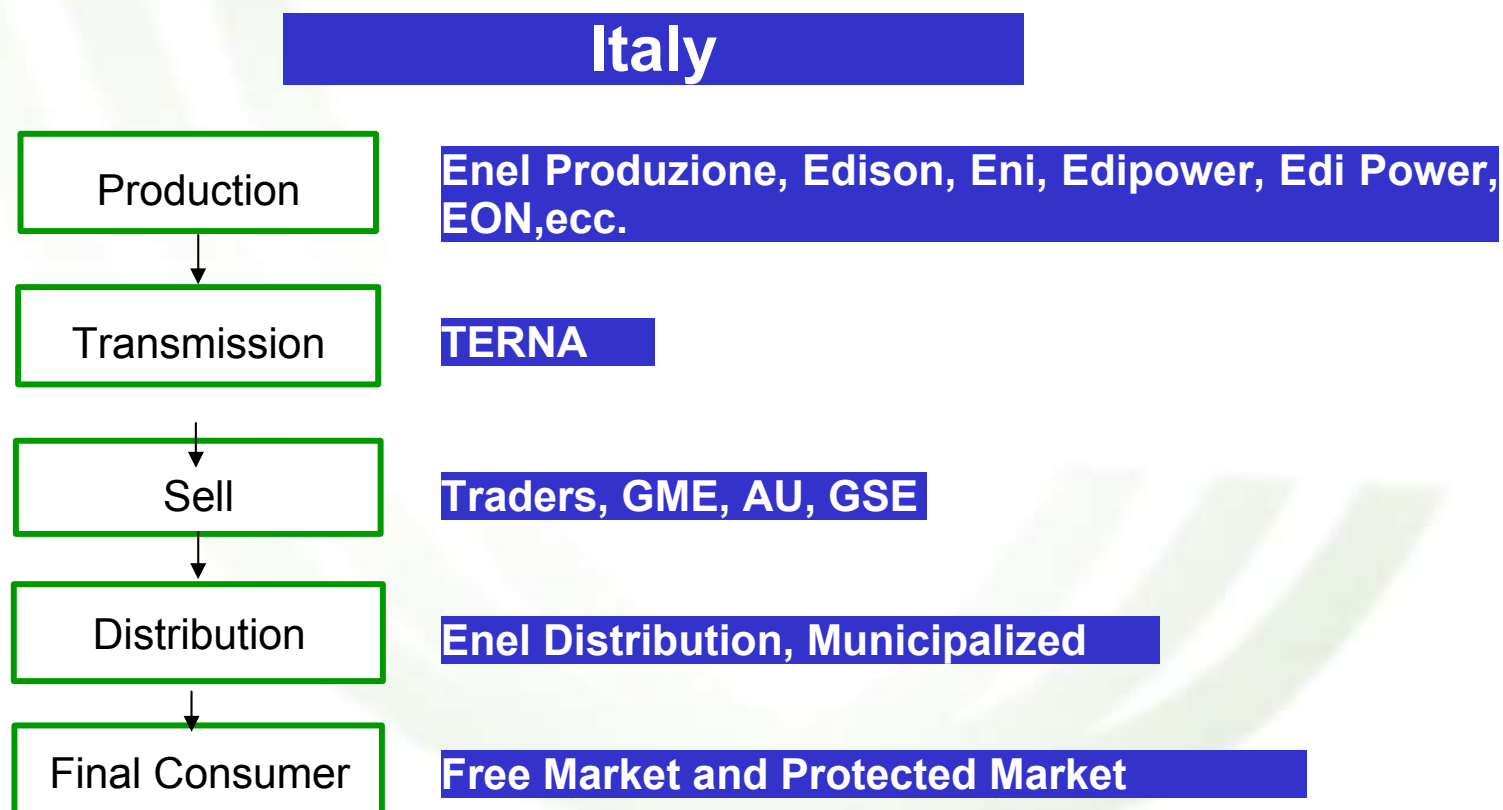
GSE was commissioned to conduct a study an effective application of art. 9 of Dir. 2009/28/EC to the ELMED project

Contents of GSE Analysis

- 1. Regulatory analysis of the electricity market in Tunisia*
- 2. Assessment of technical requirements for benefiting from the Italian schemes of RES-E support and certification of origin*
- 3. Analysis of the Italian regulatory framework in view of granting the national support*

The Italian Electricity system

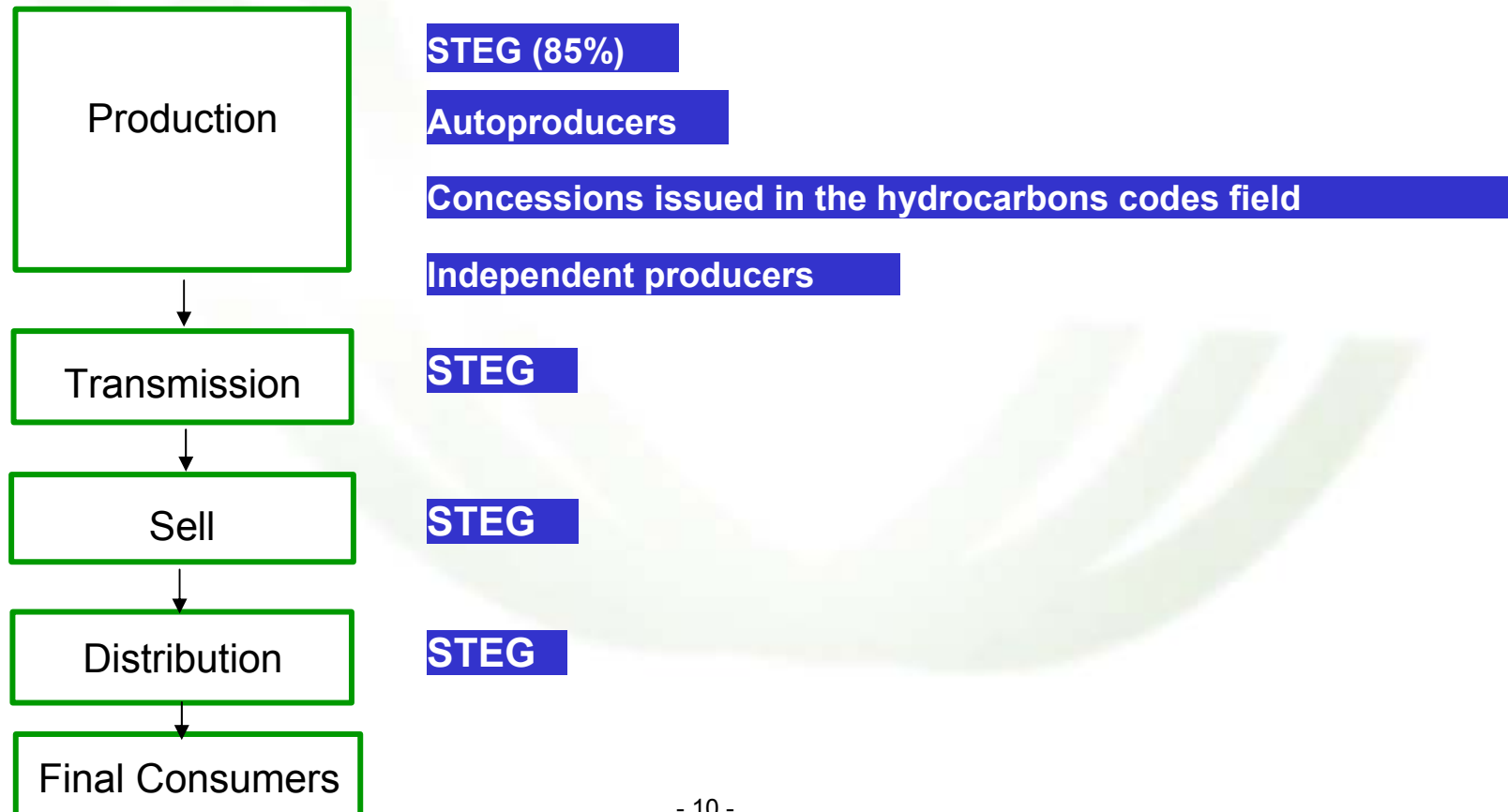
Liberalization process from 1999: is mandatory the separation of the main activities in the electricity sector to ensure the independence of the infrastructure management and a non-discriminatory access to the grid.



- Every entity interested in importing/exporting from/to Italy using the neighboring countries interconnection grids, must submit a contract in dispatching injection and withdrawal with TERNA.
- After the positive verification of the needed requirements for the access to the grid, TERNA defines the Production Virtual Unit and the Consumption Virtual Unit in the virtual market area related to the interconnection.

Structure of the electricity system in Tunisia

- The electricity system in Tunisia has been constantly growing during the past years.
- In 1996 has started a process of opening up the electricity market, encouraging the development of private investors projects in the electricity production sector.



- 2009: the Tunisian Government has modified its regulatory framework benefiting the electricity production from renewable energy sources and energy efficiency, by defining a non-binding national target of 10% of production from renewable energies sources, mostly from wind power (target 2011: 180MW)
- Big industrial producers might autoproduce energy from renewable energy sources and sell to STEG the exceedings in the limits of 30% of the annual production
- The 30% threshold might be exceeded for biomass power plants which do not overcome 15 MW.

GSE proposed lines of action for the Tunisian Government

- Opening up the export market for electricity producers;
- Identifying criteria of access to the international market:
 - ✓ generation allocated for exports may be fully liberalised or subject to authorisations;
- As regards interconnection, issuing rules on access to transmission capacity and possible management of congestions;
- Allocating transmission capacity to the joint TERNA-STEG company, which will implement the interconnection;
- Establishing that STEG may participate in generation of electricity for exports, subject to transparent and non-discriminatory rules of access to the European market

Tunisia – National and International env. Legislation

- There are no binding rules which exclude some sources on the basis of the carbon content of the kWh generated therefrom.
- Tunisia has joined the Kyoto Protocol but it is not obliged to respect the emissions constraints imposed on Annex 1* countries
- Mandatory environmental impact assessment for power plants above 300 MW

Possibility to use the CDM

- ✗ Power plans whose production is ment to be exported, totally or partially.
- ✓ **Power plants whose production is intended for the local market.**

* Of the United Nations Framework Convention on Climate Change

BINDING targets to 2020 for the overall EU (Dir. 2009/28/EC)

Gross Final RES Consumption
Gross Final Energy Consumption



≥ 20%

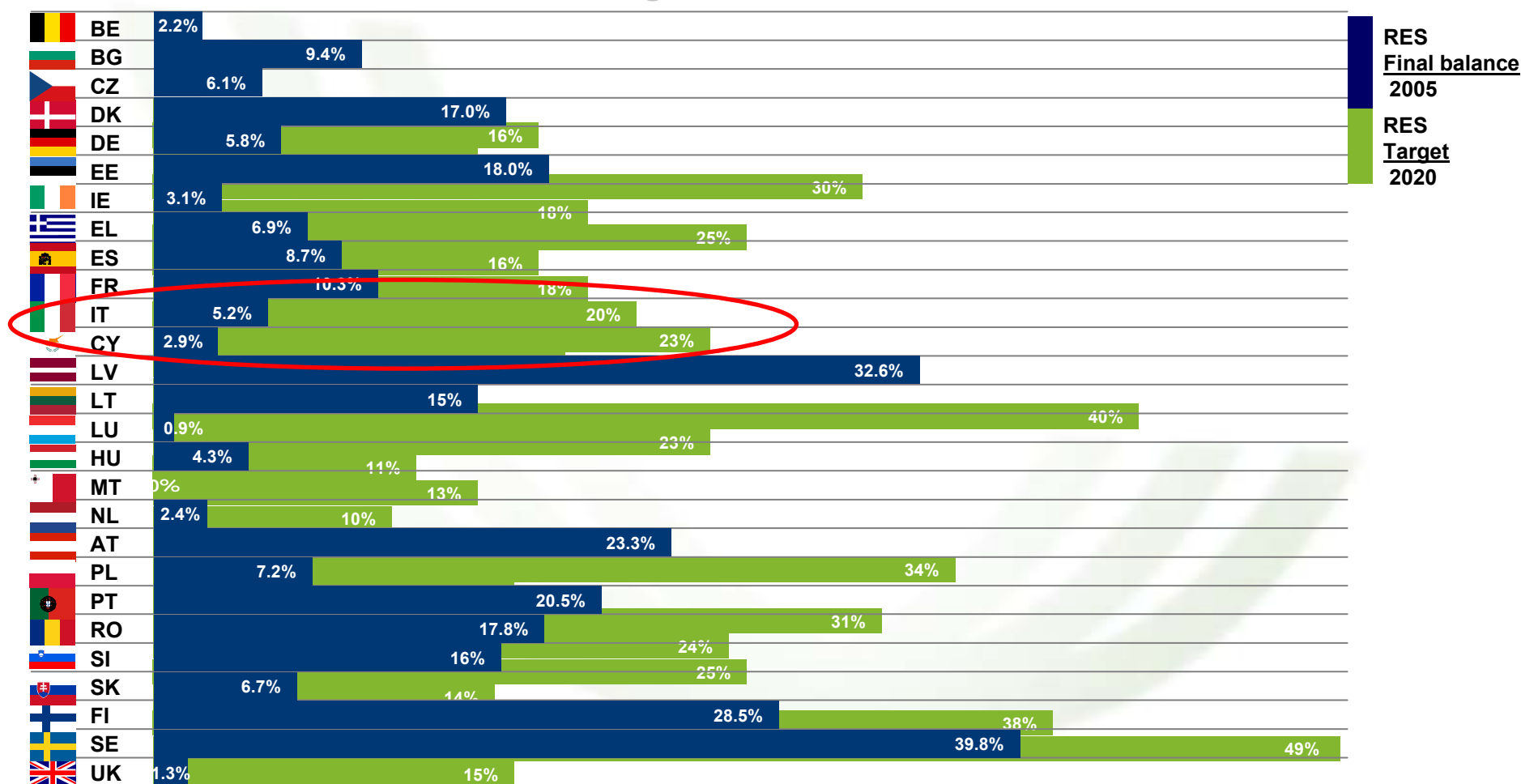
RES Consumption in Transports
Final Energy Consumption in Transports



≥ 10%

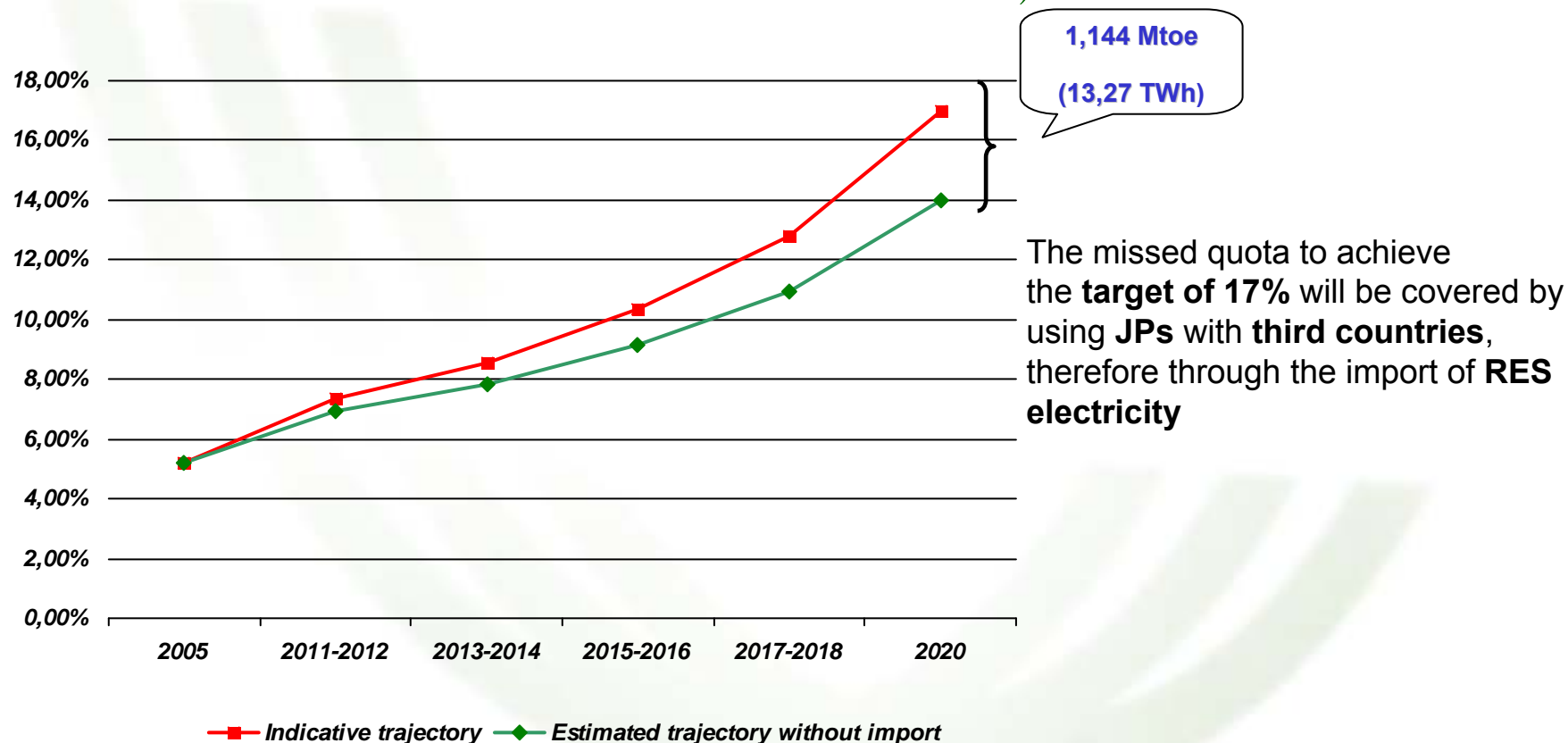
Burden Sharing

National overall targets and 2005 Final Balance



Use of JPs from the Italian side

Forecasts up to 2020 (as shown in the Forecast Document 2009 and confirmed by the NAP submitted to EC in June)



Italian National RES Action Plan - In the scope of Dir. 2009/28 (art. 4)



Gross final energy consumption of the three main sectors in 2005, in 2008 and in 2020

Consumi finali lordi di energia e obiettivi per le energie rinnovabili									
	2005			2008			2020		
	Consumi da FER	Consumi finali lordi (CFL)	FER / Consumi	Consumi da FER	Consumi finali lordi (CFL)	FER / Consumi	Consumi da FER	Consumi finali lordi (CFL)	FER / Consumi
	[Mtep]	[Mtep]	[%]	[Mtep]	[Mtep]	[%]	[Mtep]	[Mtep]	[%]
Elettricità	4,846	29,749	16,29%	5,040	30,399	16,58%	9,112	31,448	28,97%
Calore	1,916	68,501	2,80%	3,238	58,534	5,53%	9,520	60,135	15,83%
Trasporti	0,179	42,976	0,42%	0,723	42,619	1,70%	2,530	39,630	6,38%
Trasferimenti da altri Stati	-	-	-	-	-	-	1,144	-	-
Totale	6,941	141,226	4,91%	9,001	131,553	6,84%	22,306	131,214	17,00%
Trasporti ai fini dell ob.10%	0,338	39,000	0,87%	0,918	37,670	2,44%	3,419	33,975	10,06%

The Renewable Energies development in Italy



Gross final energy RES production in 2009 and in 2020

	2009			2020		
	Installed Power RES-EE	Gross Production RES-EE		Installed Power RES-EE	Gross Production RES-EE	
	MW	GWh	[ktep]	MW	GWh	[ktep]
Hydro	16.458	42.155	3.625	17.800	42.000	3.612
Geothermal	737	5.342	459	920	6.750	580
Solar	1.142	676	58	8.600	11.350	976
Tidal and tidal waves	0	0	0	3	5	0,4
Wind	4.898	6.830	587	12.680	20.000	1.720
Biomass	1.728	7.631	656	3.820	18.780	1.615
Total	24.962	62.634	5.387	43.823	98.885	8.504

Electricity from renewable energy sources produced in a third country shall be taken into account only for the purposes of measuring compliance with the requirements of this Directive concerning national overall targets if the following conditions are met:

The electricity is consumed in the Community, a requirement that is deemed to be met where:

- » the electricity is produced by a newly constructed installation that became operational after 25 June 2009 or by the increased capacity of an installation that was refurbished after that date, under a joint project
- » the amount of electricity produced and exported has not received support from a support scheme of a third country other than investment aid granted to the installation

Member States may apply to the Commission, for the purposes of Article 5, for account to be taken of electricity from renewable energy sources produced and consumed in a third country, in the context of the construction of an interconnector with a very long lead-time between a Member State and a third country if the following conditions are met:

- **construction of the interconnector started by 31 December 2016**
- **it is not possible for the interconnector to become operational by 31 December 2020**
- **it is possible for the interconnector to become operational by 31 December 2022**
- **after it becomes operational, the interconnector will be used for the export to the Community, in accordance with paragraph 2, of electricity generated from renewable energy sources**

Art. 9 Directive 2009/28/EC

- The electricity is produced by a newly constructed installation that became operational after 25 June 2009 or by the increased capacity of an installation that was refurbished after that date
- The electricity is consumed in the Community

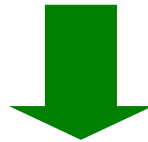
Qualification of RES-E Power Plants (Italian « IAFR »)

- Essential condition to access to Italian support schemes and to the recognition of Guarantee of Origin (GO)
- Definition of a procedure of Qualification of RES-E Power Plants
- identification of an independent entity of the electricity generation, sale, distribution and transmission business
- actual import and traceability of electricity generation

Actual import and traceability of electricity generation must be ensured by:

- Certification by the Tunisian TSO that the allocated interconnection capacity corresponds to electricity imported in Italy on an hourly basis
- Certification by Terna of the volume of the imported electricity for consumption in Italy, on an hourly basis
- Affidavit that the incentivised electricity did not receive a support system other than an investment aid granted for the plant
- Measurement data of production on an hourly / daily basis

The Legislative Decree implementing the Directive should explicitly empower the competent Ministry to enter into bilateral agreements on the granting of support for RES-E generated abroad



The Bilateral Agreement should identify:

- The support scheme
- The RES-E sources admitted to receive a support

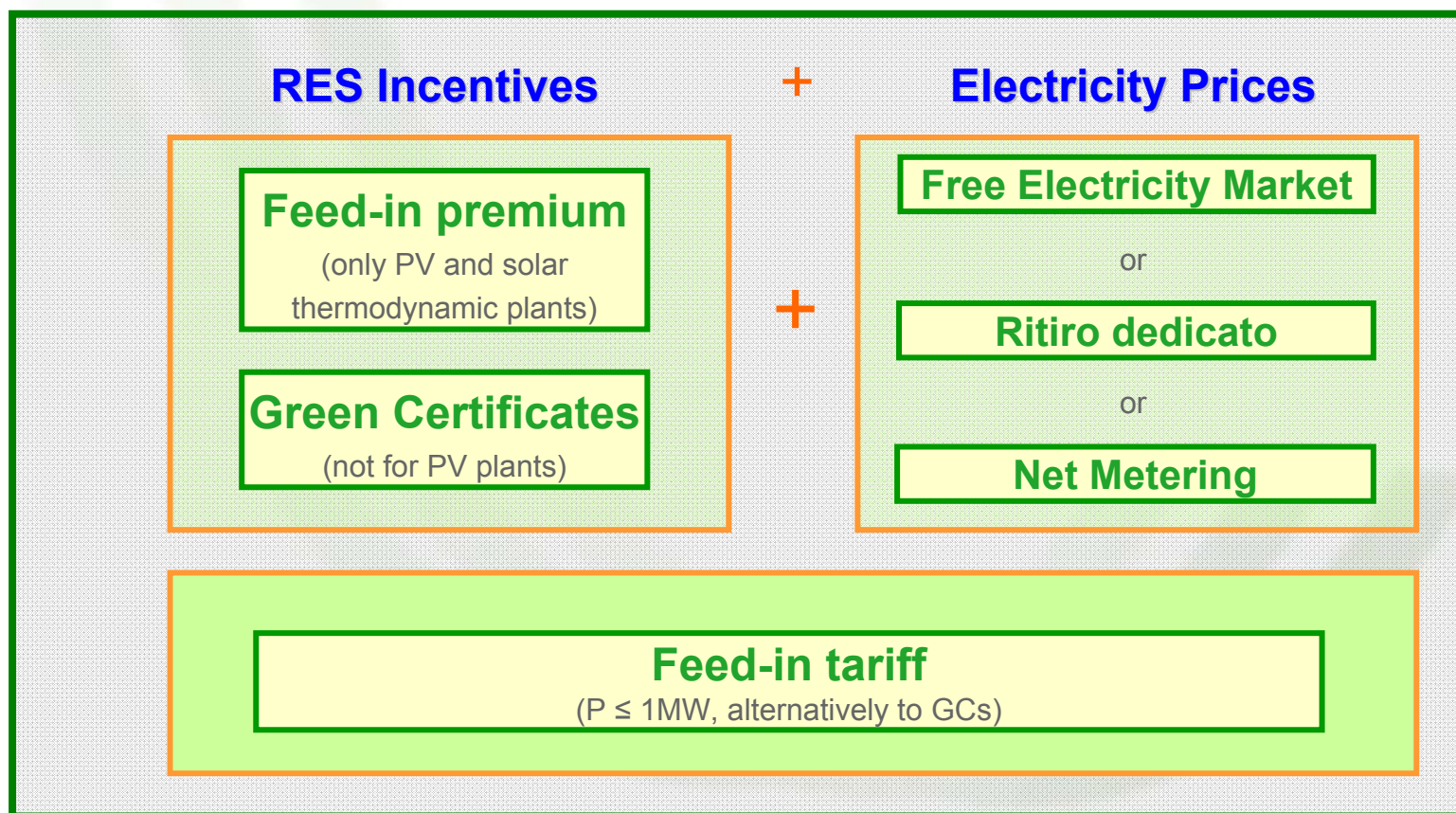
➤ **It is worth stressing that:**

- ✓ the Legislative Decree implementing the Directive should explicitly empower the competent Ministry to enter into bilateral agreements on the granting of support for RES-E generated abroad

➤ **GSE deems that:**

- ✓ it reasonable to define the values of the support and the eligible sources in such agreements
- ✓ the operational aspects concerning the actual granting of the support for the RES-E exported to Italy may be covered by subsequent procedures, to be defined jointly by GSE and its foreign counterpart

General Framework



The Green Certificates mechanism

Key elements of the system

- It is based on a **quota obligation** on electricity from conventional sources **for each producer/importer** (EE produced/imported above 100 GWh of each producer/importer);
- Producers and importers **must feed in the electric grid an amount of renewable source energy** equal to the x % (6,05 % for the 2010) of not renewable energy produced or imported the year before (**obligations are up-graded to 0,75% per year**);
- Producers and importers can fulfill their obligation by means of GC issued in favor of their own renewable electricity production or of other producers;
- The support is granted over **15 years**;
- Green Certificates have a validity of **3 years**;
- 1 GC is issued in front of each **MWh produced** multiplied for the “**k**” factor;
- The producers during the support period can only once switch to the **TO mechanism (if power < 1MW) and viceversa**
- Green Certificates can be sold or purchased through:
 - ✓ **Bilateral agreements** or through
 - ✓ **GME trading platform**

Reference laws: L. 79/99; D. lgs. 387/03; L. 244/07; L. 222/07; D.M. 18/12/2008, L. 99/09

GSE's activities

- Power Plants qualification: to get GC, RES power plants must request and obtain the qualification (positive assessment concerning the source and the technical characteristic of the p.p.). The Qualification is awarded by a Technical Commission and the process is ruled by a specific procedure, published on GSE web site, and it is based on silence approval
- Issuing of GC: GSE, on demand, issues GC ex ante (for the current or the following year, taking into account the foreseeing production; subsequent compensation is made on the basis of the actual production) or ex post (for the previous year in accordance with the metered production). GCs are accredited on a nominative electronic account
- Assessment of the obligation compliance: each year, within 31 March, GSE checks the compliance of market players related of the previous year
- Withdrawing expired and unsold certificates: the value paid for such certificates is the “GSE withdrawal price” equal to the average certificate price registered in the market during the preceding year
- Publication of Annual Statistic Bulletin

The Green Certificates mechanism

$$E_{cv} \text{ (MWh/y)} = E_i \text{ (MWh/y)} \times K$$

E_{cv} = Annual electricity supported with GC
 E_i = Electricity incentivised taking into account the **category of the plants** (new, upgraded, refurbished, etc...) and the renewable source
 K = multiplication factor differentiated by **source**

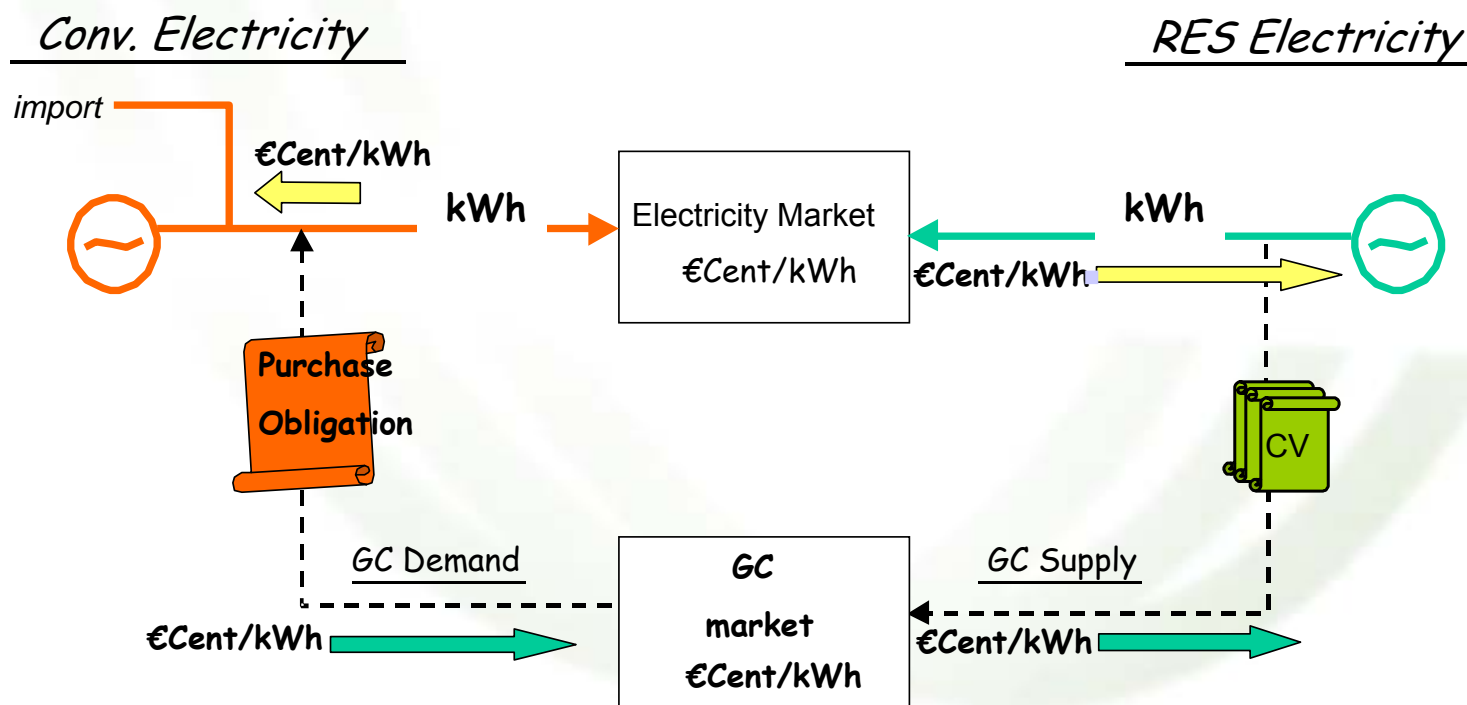
$$VCVn^* \text{ (€/MWh)} = 180 - PCE \text{ n-1}$$

$VCVn$ = Reference Value of GC (year n)
 $PCE \text{ n-1}$ = Price defined by AEEG for the year n-1

	Source	Ratio
1	Wind > 200 kW	1,00
1- bis	Wind off-shore	1,50
2	Solar	FIP
3	Geothermal	0,90
4	Tidal & Wave	1,80
5	Hydro	1,00
6	Biodegradable wastes and biomass other than that ones at point 7	1,30
7	Biomass and biogases obtained from agriculture, animal husbandry and forestry on a short supply-line basis	1,80
8	Landfill gas, sewage treatment plant gas and biogases (other than the ones indicated in the previous point)	0,80

The Green Certificates mechanism

Electricity and Green certificates markets



The Feed-in tariff system (TO)

- **Small plants** may obtain an “All-inclusive Tariff”, **alternatively** to Green Certificates
 - May be incentivized through the feed-in tariff system only renewable power plants, **except for PV plants**, with a total capacity **< 1MW** and **< 200kW** for wind plants
 - The amount of tariff is **differentiated by source** and will be **updated every three years** through specific ministerial decrees
 - The support is granted over **15 years**
-
- ✓ **Power Plants Qualification:** to get TO, RES power plants must request and obtains the qualification (positive assessment concerning the source and the technical characteristic of the p.p.). The Qualification is awarded by a Technical Commission and the process is ruled by a specific procedure, published on GSE web site, and it is based on silence approval.
 - ✓ **Granting of TO:** GSE transfer the support (ex post, on monthly basis) on demand of the producers. The producers during the support period can only once switch to the GC mechanism and viceversa

The Feed-in tariff system (TO)

	Source	Tariff (euro cent/kWh)
1	Wind < 200 kW	30
2	Solar	FIP
3	Geothermal	20
4	Wave & Tidal	34
5	Hydro	22
6	Biomass, biogases and bioliquids (vegetal oil) when complying with EU Regulation 73/2009	28
8	Landfill gas, sewage treatment plant gas, biogases and bioliquids	18

The incentive is granted for the electricity produced and injected into the grid



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