

National Energy and Climate Plan. Targets and measures

ENERGY IN MOTION
TOWARD 2030

5th June 2019

GSE
GUARANTEES THE SUSTAINABLE DEVELOPMENT OF OUR COUNTRY
PROMOTES RENEWABLE SOURCES AND ENERGY EFFICIENCY

**CLIMATE RECON
2050**

GSE ROLE

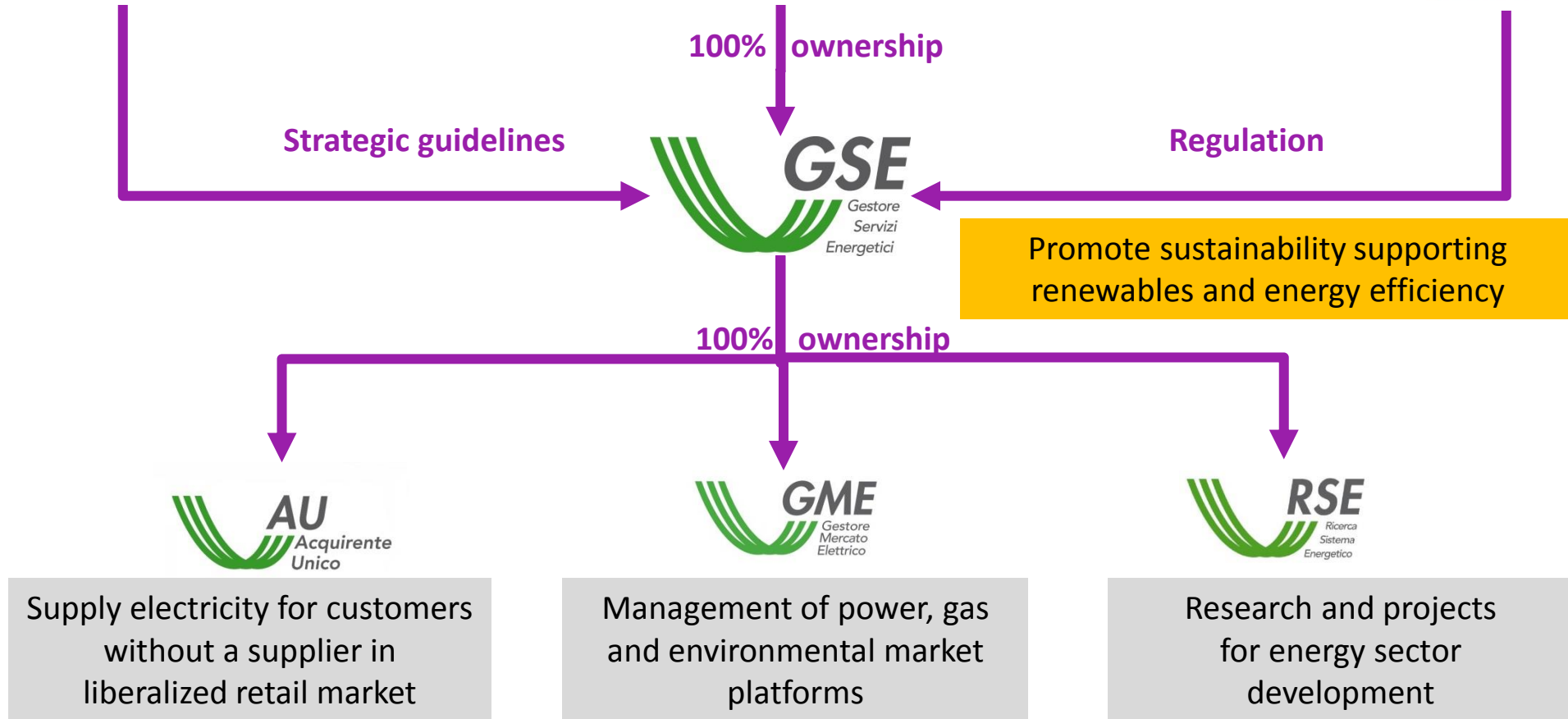
Ministry of Economic Development



Ministry of Economy and Finance

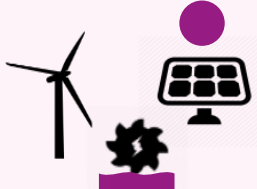





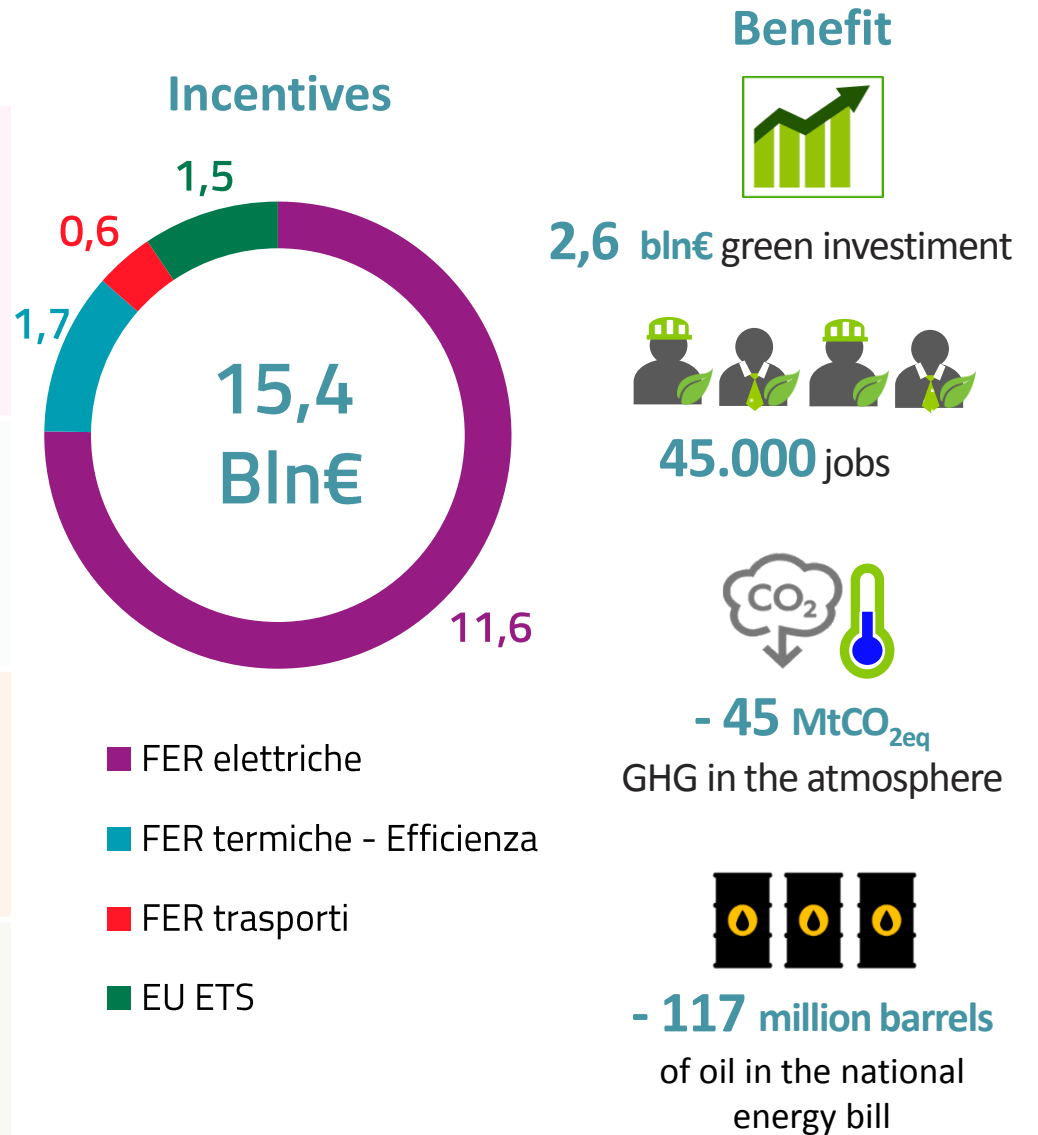
Regulatory Authority for energy, grid and Environment



GSE ACTIVITIES – A VIEW ON ITALIAN INCENTIVES

In 2018, about **800.000 plants** managed, **1.300.000 public-private partnerships** and **15,4 € billion incentives**

Scope	Measures	Activities	Energy
RES-E 	MD 23/6/2016 MD 6/7/2012 Conto Energia FV Incentivo ex CV, TO CIP 6 Net billing Simplified purchase	1.300.000 Contracts 800.000 RES Plants	67 TWh RES electricity incentivized
RES-H Energy Efficiency 	Conto termico White Certificates High efficiency CHP	100.000 Requests	3 Mtep Primary energy saving
RES-T 	CIC Biometano	6.000 Biofuel certifications	11 mln Gcal Biofuels
Emission CO₂ 	EU ETS Small issuers	139 Auction session	93 MtCO₂ Emissive permits allocated



NATIONAL TARGETS FOR 2030 – DRAFT NECP

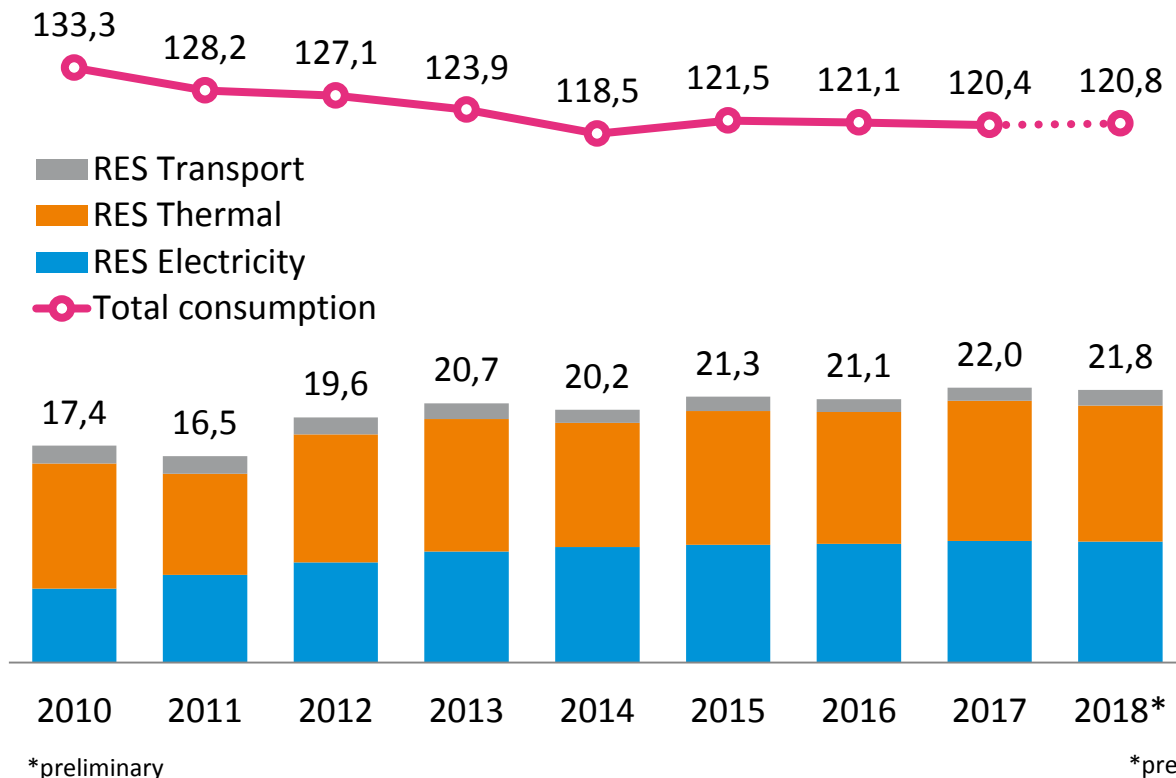
Main targets on energy and climate for EU and Italy for 2020 and 2030

	2020 targets			2030 targets	
	EU	ITALY		EU	ITALY (NECP targets)
Renewables					
RES share on total gross final consumption	20%	17%		32%	30%
RES share on transport gross final consumption	10%	10%		14%	21,6%
RES share on gross final consumption for heating and cooling				+ 1,3% year	+ 1,3% year
Energy efficiency					
Reduction compared to scenario PRIMES 2007	- 20%	- 24%		- 32,5%	- 43%
Reduction of final consumptions through active policies	- 1,5% year (no transp.)	- 1,5% year (no transp.)		- 0,8% year (with transport)	- 0,8% year (with transport)
GHG emissions					
Reduction GHG vs 2005 for ETS plants	- 21%			- 43%	
Reduction GHG vs 2005 for non ETS sectors	- 10%	- 13%		- 30%	- 33%
Total reduction of GHG compared to 1990	- 20%			- 40%	

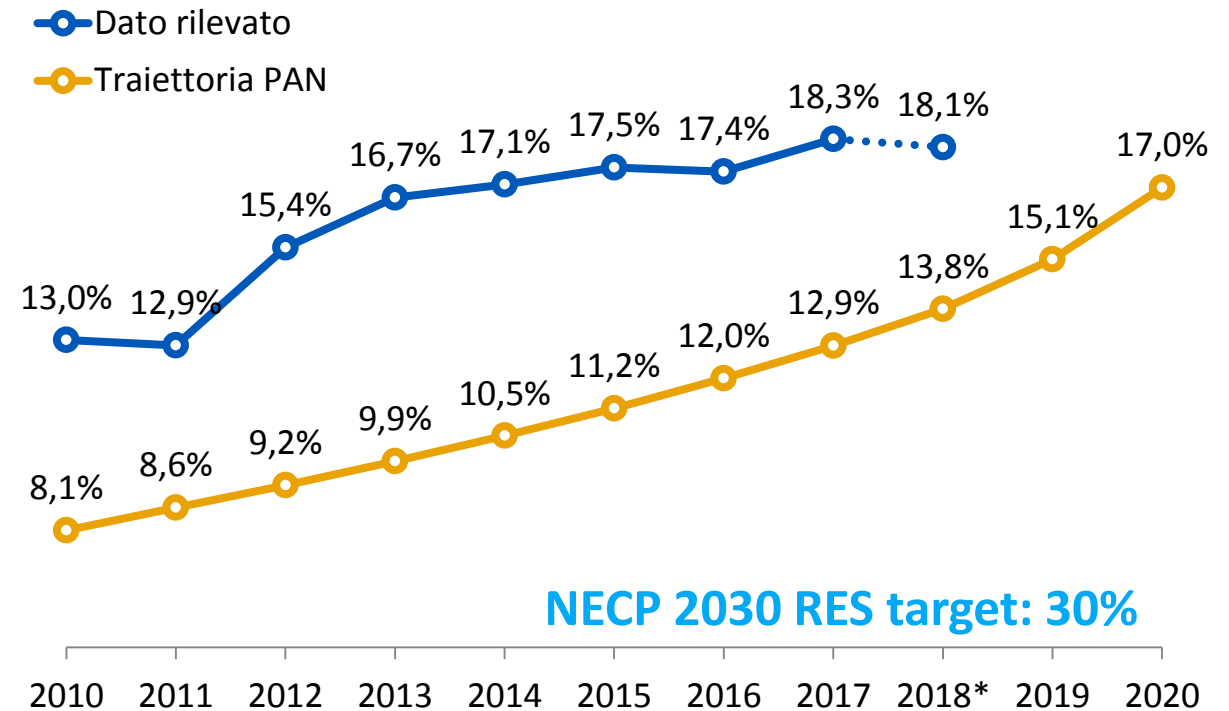
RES TARGET MONITORING: WHERE WE ARE

- In 2017 the **share of renewables** in gross final energy consumption was **18,3%**, higher than 2020 Italian mandatory target set up by Directive 2009/28/EC (**17%**)
- Preliminary GSE estimation indicates a **RES share around 18,1% in 2018**
- Observed trend: **growth of RES consumptions**, slower in recent years; **decrease then weak recovery of total consumption**

RES and total gross final consumption [Mtoe]



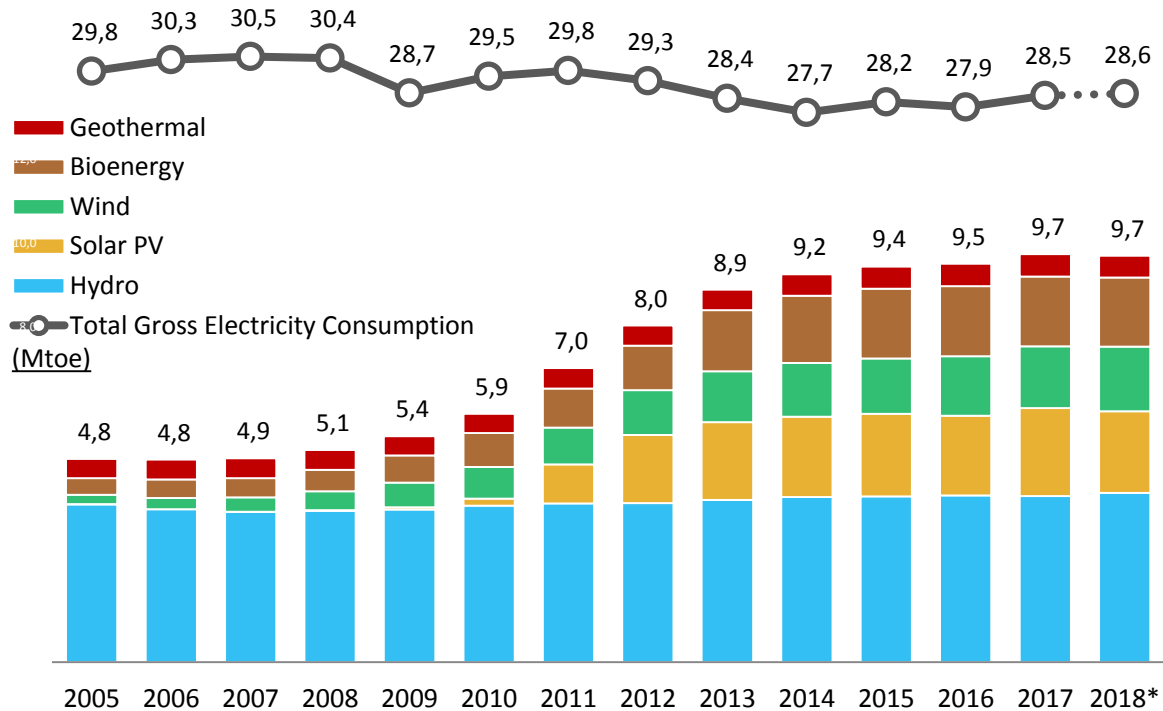
Share of RES consumption and 2020 target



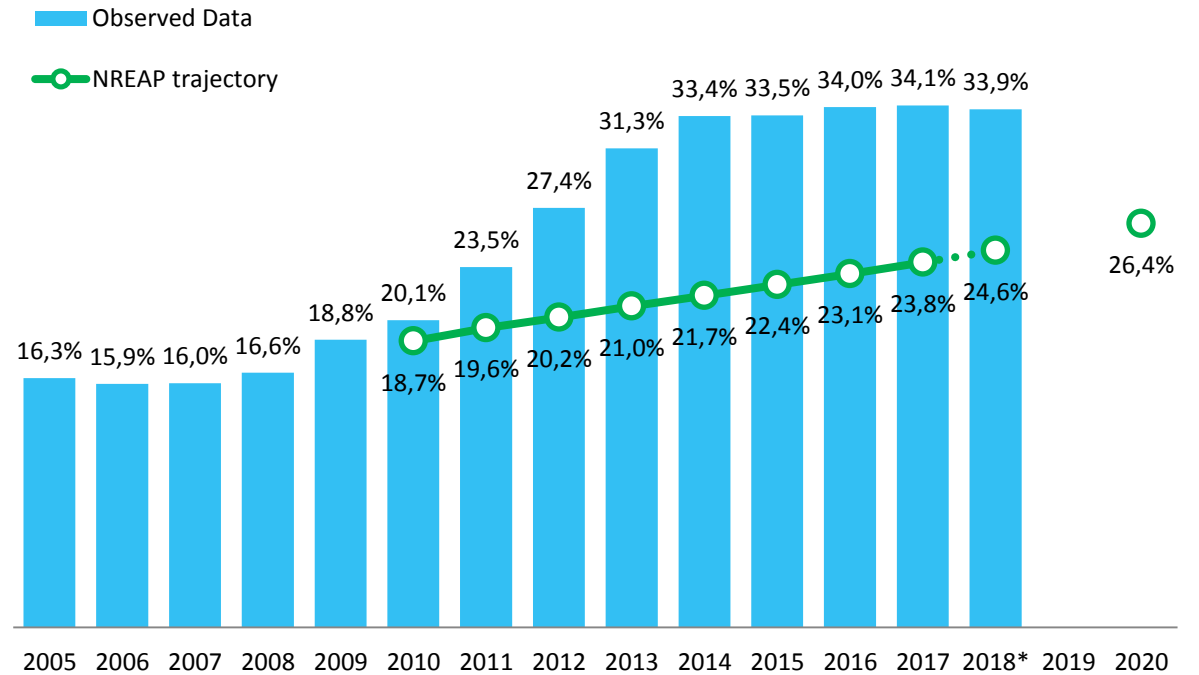
RES-E TARGET MONITORING: WHERE WE ARE

- NREAP 2020 target for **Electricity Sector** is largely exceeded in 2018. Mainly due to the massive deployment of **PV** installations
- Total RES generation in 2018 amount to **115 TWh**, of which **hydro** has the largest value: **49 TWh**
- PV production in 2018 is equal to **23 TWh**

RES-E Trend per Sources – 2005-2018 (Mtoe)



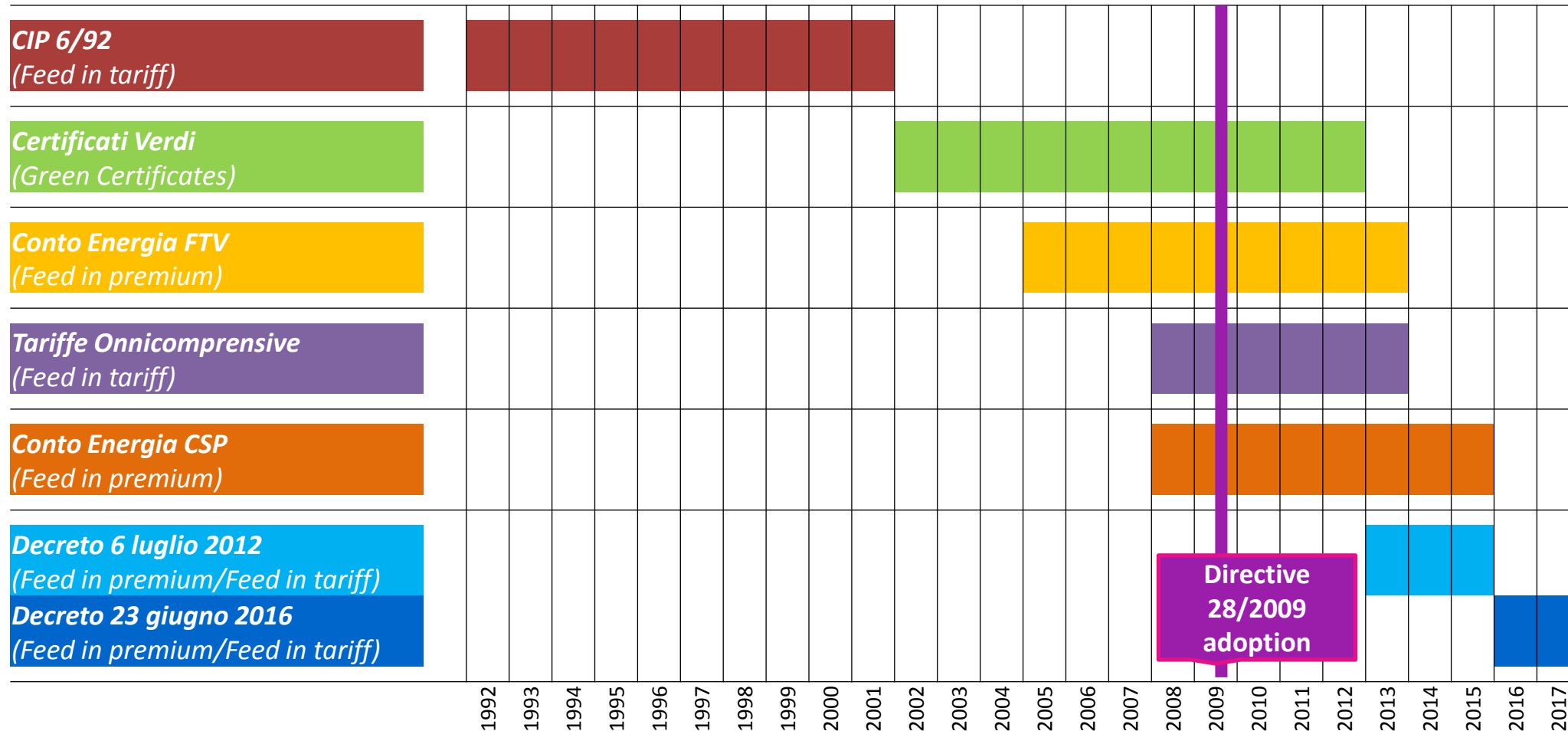
RES-E share Trend – 2005-2018



* Preliminary data

HOW DID WE GET HERE? SUPPORT SCHEMES TIMELINE

Approximate periods of eligibility for support schemes in electricity sector



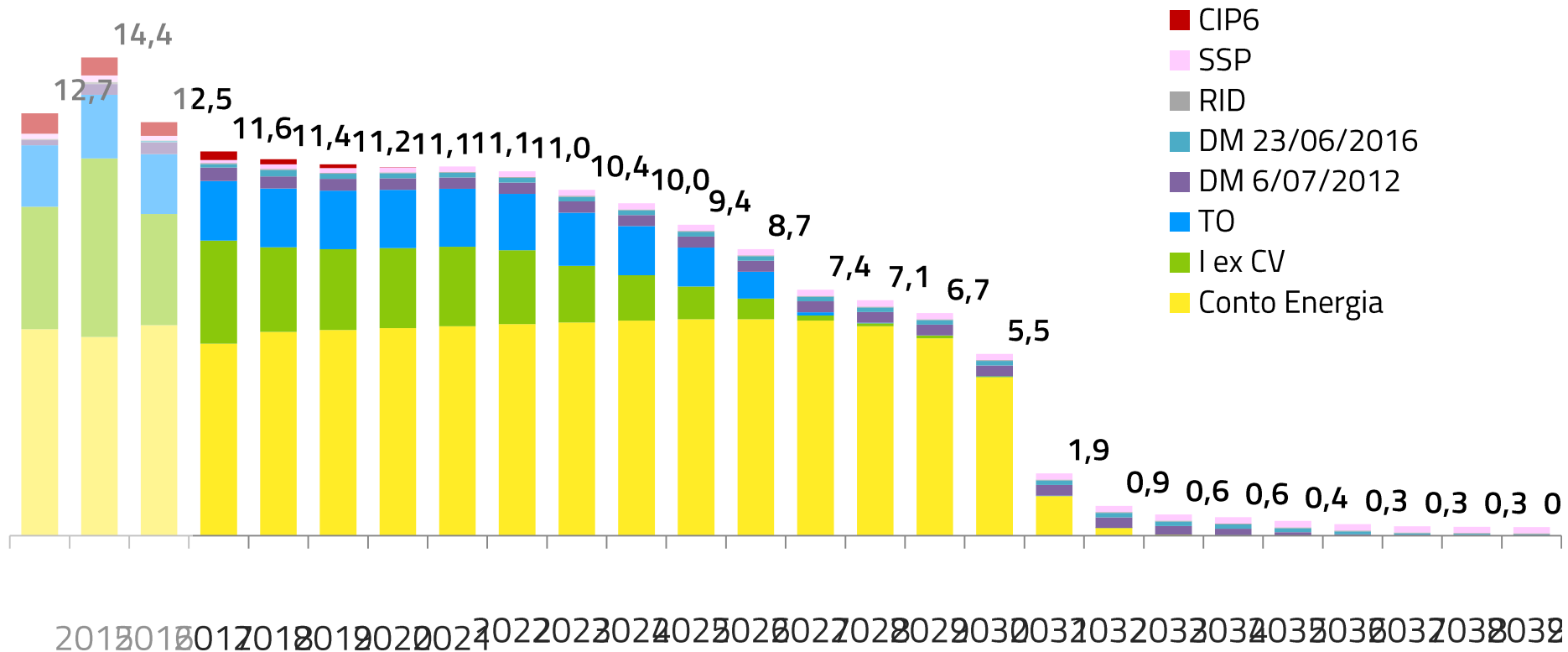
- Various measures provided also **financial support** for interventions (**refurbishments, total rebuilding, enhancements and reactivations**) aiming at **extending the lifetime of plants**, through direct access or competition procedures (registries and auctions) for the financial support
- Currently it is in force a **discipline for the interventions on the existing and already supported installations** that allow to **go beyond the classic support concept** for fostering the RES-E production

COST AND BURDEN OF INCENTIVES IN 2018

A scenario of the RES burden evolution was drawn up, considering:

- expiry of incentive period for RES plants
- gradual entry of new RES plants with current incentive schemes (MD 23/6/2016, MD 6/7/2012 and net metering) without considering new policies & measures
- Increasing estimated energy price, from 60 €/MWh to almost 69 €/MWh in 2030

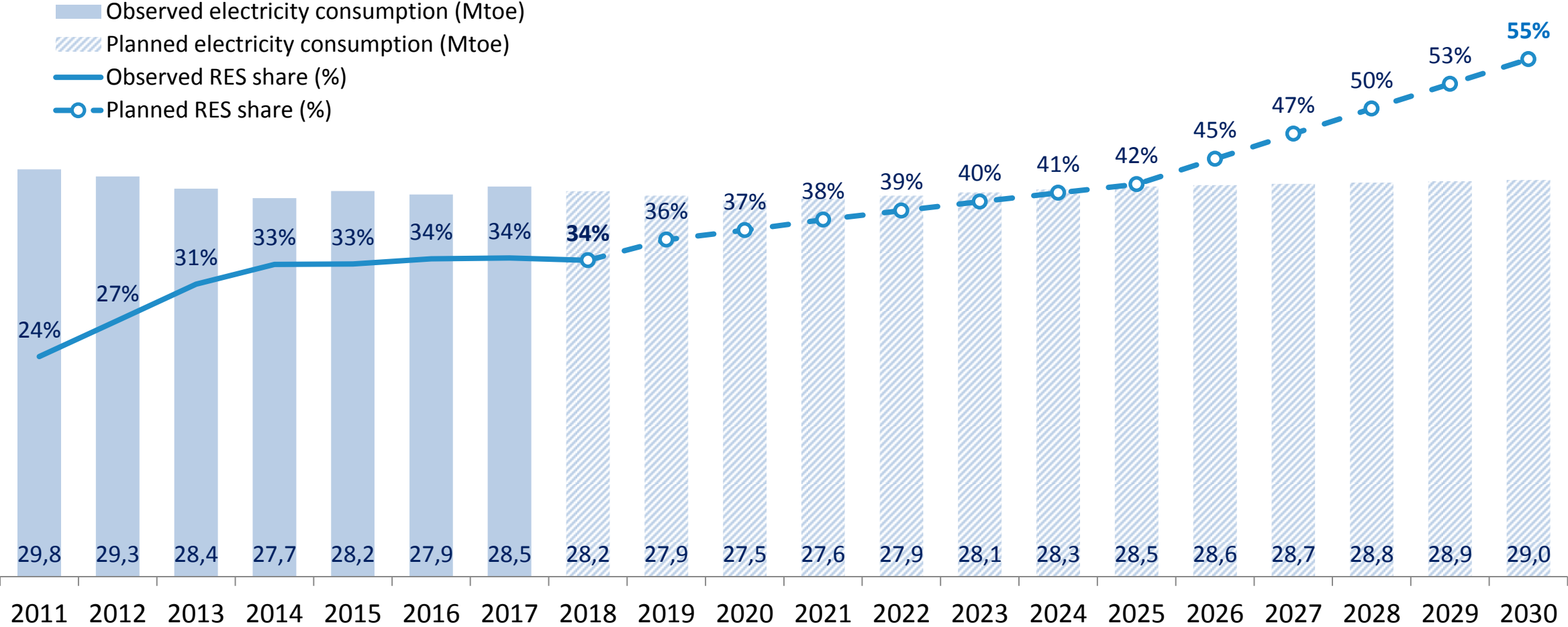
Scenario of RES burden evolution (billion euros) by supported mechanism



- By **2030** the incentives burden could decrease to about **6,7 bn €**
- By 2030 the incentives of **22 GW** plants are going to expire
- The burden will decrease for the end of the supporting period of the PV plants (Conto energia)

ITALY'S NECP PROPOSAL: RENEWABLE TARGETS in electricity sector

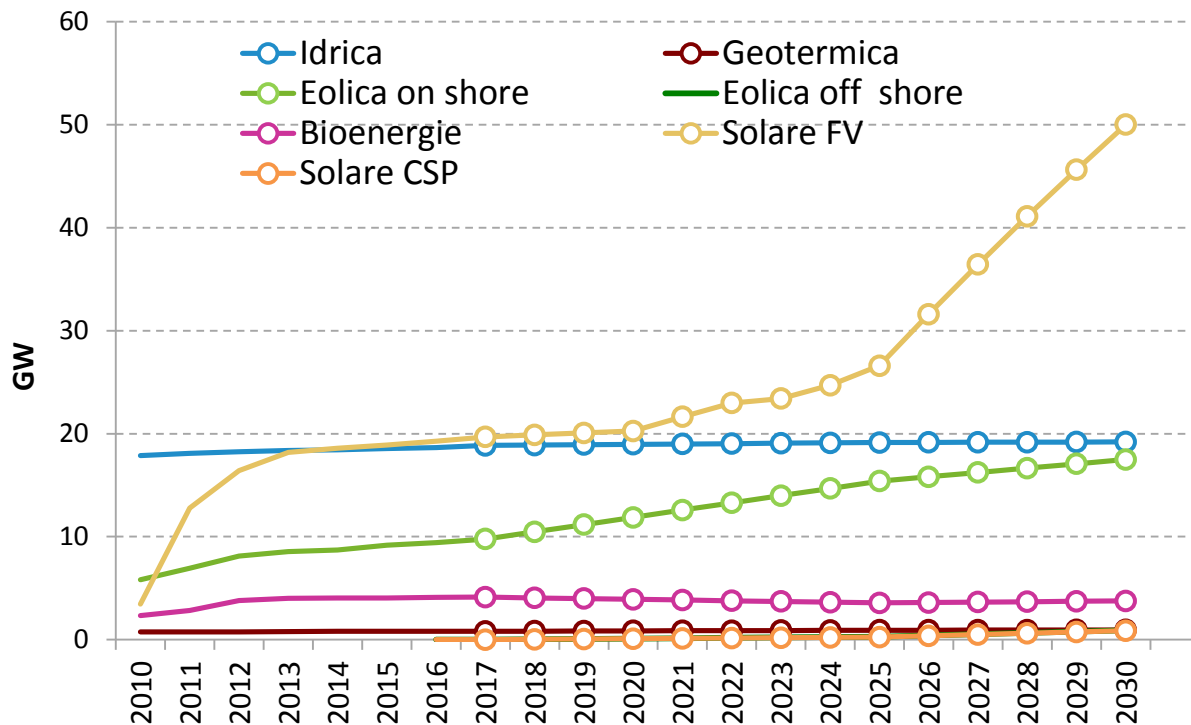
- In NECP proposal Italy has defined a **challenging target of 30% in the overall RES share**
- In the **electricity sector**, an **ambitious target of 55%** has been set in **2030**, starting from the current 34%



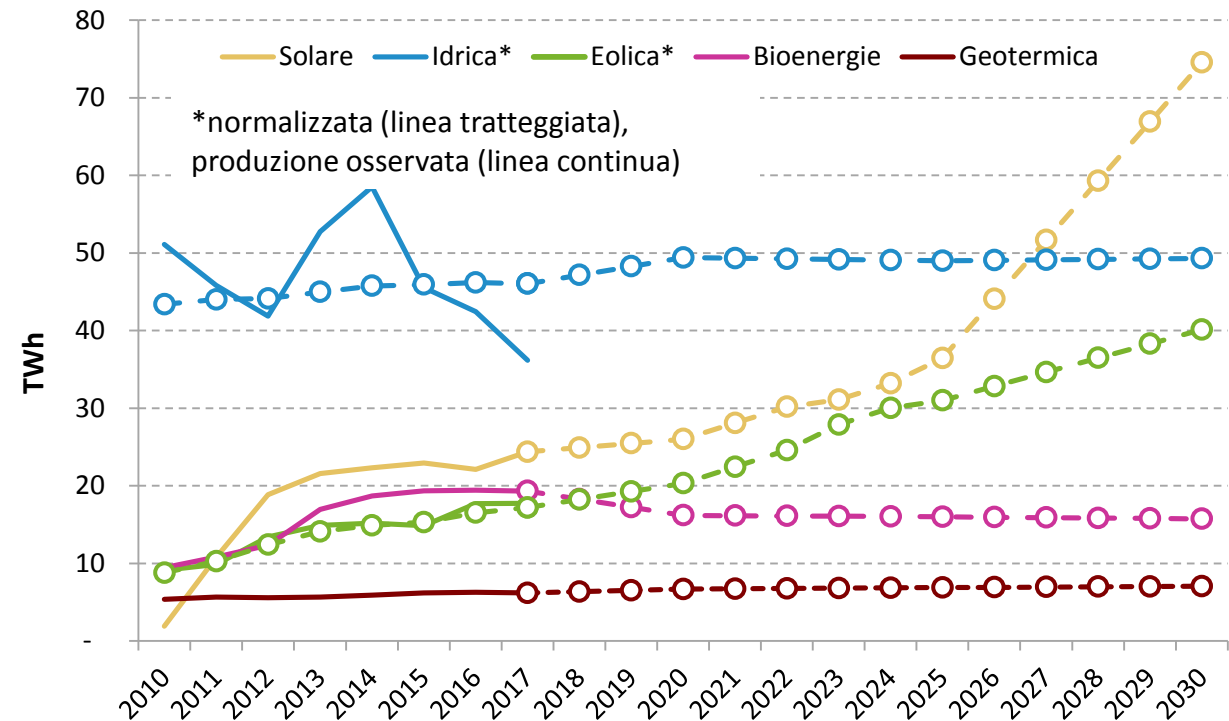
EVOLUTION OF RES: THE ROAD TOWARDS 2030

- Increase of renewable capacity up to **93 GW on 2030, (+40 GW compared to 2017)**. Main contribution from photovoltaic (**50 GW on 2030, + 30 GW**), followed by wind (**18 GW on 2030, +8 GW**).
- Renewable electricity is expected to reach **187 TWh on 2030** (113 TWh on 2017). Main contribution from photovoltaic (**almost 75 TWh on 2030, +50 TWh**), followed by wind (**40 TWh on 2030, +23 TWh**)

Expected contribution for renewable electricity [GW]



Expected contribution for renewable electricity [TWh]



MAIN POLICIES AND MEASURES IN ELECTRICITY SECTOR



- **Competitive procedures and PPA for large plants.** In a first step competitive schemes, mainly **auctions**, and 2-ways contracts. Then **PPA**, favoring aggregators of the demand and **outlining the public role**

- **Environmental sustainability and consultation with local bodies.** Priority to **photovoltaics on buildings** or areas not suitable for other uses, and involvement of local authorities both in terms of objectives (regional burden sharing) and to identify suitable areas



- **Promotion of self-consumption.** Self-consumption from small plants with exemption of the variable quota of system charges, with extension to the energy communities. Improvement and extension of the RES integration obligation in buildings. **Promotion of storage** (15 GWh coupled with PV plants), in evolution to net-billing



- **Preserve and optimize existing production.** Authorization simplification, especially environmental, for revamping and repowering. Simplification of the hydroelectric concession auction procedures, and compliance with environmental constraints and other water uses

- **Ad hoc tools for innovative technologies** with interesting potential for cost reduction

- **Small islands as a laboratory for high levels of RES** penetration and consumption electrification, also with pilot projects with storage, integration with water system and electric transport



EVOLUTION OF RES-E: THE NEW M.D. “FER1” DRAFT

- The new M.D. draft aims at supporting, in the period **2019-2021**, energy from **new, refurbished** and **upgraded** plants from “mature” RES: **PV, onshore wind, hydro and sewage gas** for a total **capacity** of about **8 GW** (of which 7,4 GW new)
- 8 rounds of competitive **AUCTIONS** for **groups of technologies** (with reserves for each technology if some conditions occur) and **REGISTRIES** for **smaller** plants, with some **competitive elements**
- Plant owners offer a **% reduction of the base tariff**: between **2% and 70%** for **auctions**, and up to **30%** for **registries** (also other criteria)
- The support is mainly a **Sliding FiP** (“**two-ways**”: owner pays GSE back in case $P_{\text{electricity}} > \text{Incentive tariff}$) and a **FiT** ($\leq 100\text{kW}$); **premium** for PV plants **removing asbestos** in addition to the incentive

Auctions (plants ≥ 1 MW)

Group	A (Wind, PV)	B (hydro, sewage gas)	C (refurbished wind,hydro, sewage gas)
Capacity (MW)	5.600	110	500

Registries: plants < 1 MW (PV >20kW)

Group	A (Wind, PV)	A-2 (PV substitution of asbesto)	B (hydro, sewage gas)	C (refurbished wind,hydro, sewage gas)
Capacity (MW)	770	800	80	80

Specific financial requirements:

- **capitalization** as proof of financial and economic stability
- **surety bond deposit** (5% temporary, 10% definitive)

Main priority criteria:

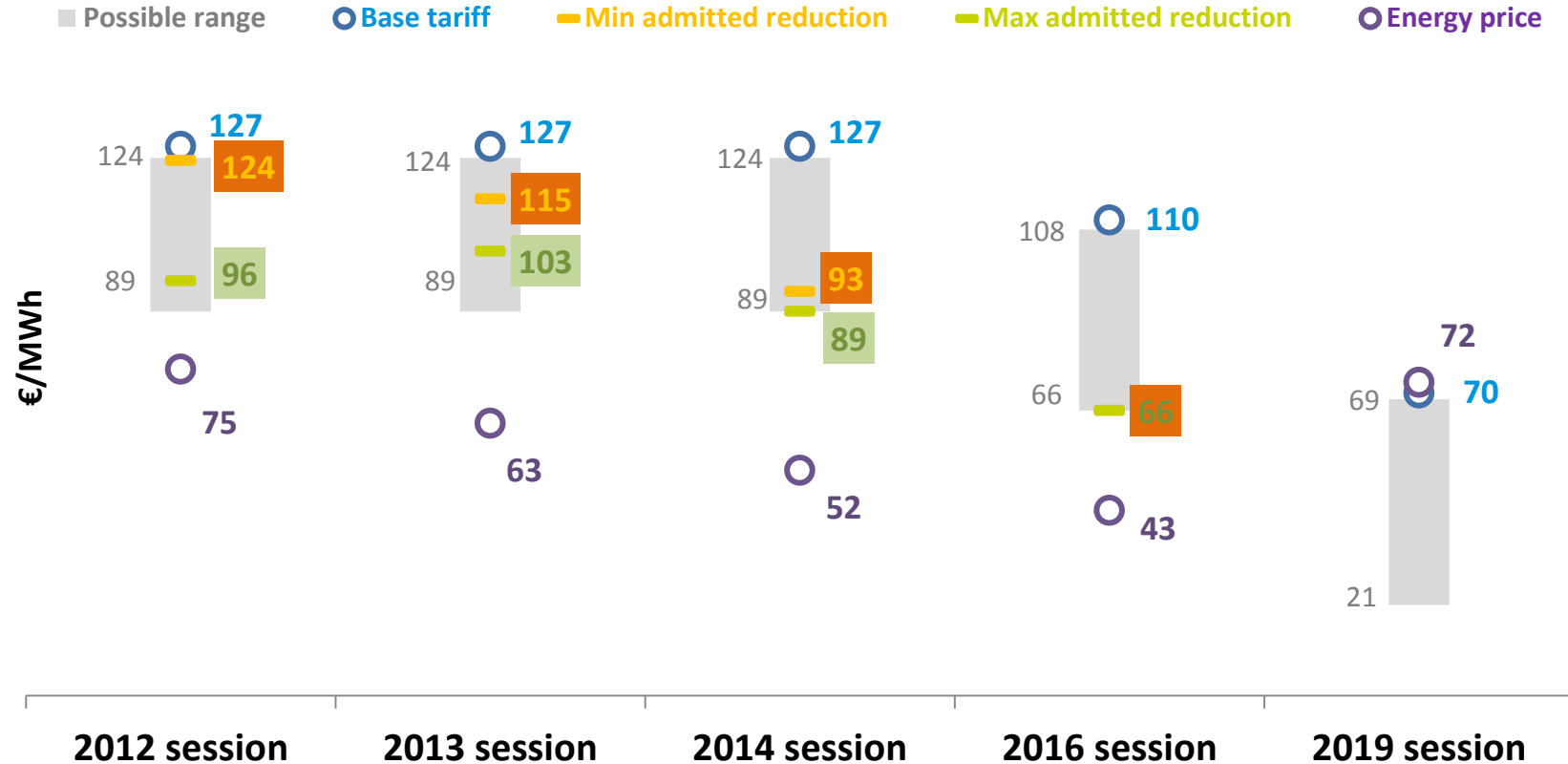
- group **A**: plants installed on **exhausted landfills** or other specific areas;
- group **A-2**: plants on **schools, hospitals, public buildings** etc;
- combined with **recharge columns** for e-mobility
- offered **reduction** of the base tariff (max 30%)



FOCUS ON PAST AND FUTURE WIND AUCTIONS

- Increase in percentage reductions offered over the four past wind bidding sessions (all plants offered the maximum allowed reduction in 2016 session, 40% of the base tariff)
- Promotion of **competitiveness** and reduction of system cost
- The tariff resulting from the latest auction is comparable and can be even **lower** than the current and future **energy price**
- Uncertainty for the **next auctions**: the **base tariffs** established in the latest Decree draft is **lower than the forward energy price**

Onshore wind auctions base tariffs and offers range



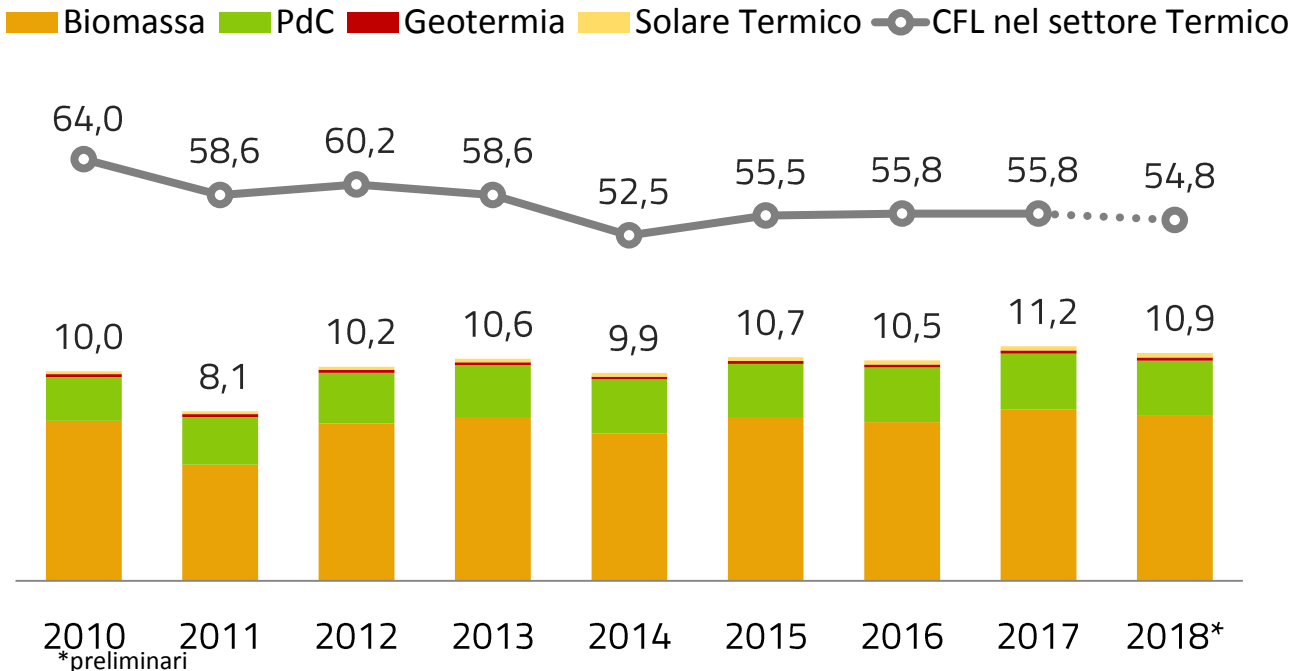
	2012 session	2013 session	2014 session	2016 session
Applied capacity (MW)	442	982	1.223	1.944
Admitted capacity (MW)	442	465	368	800
in operation capacity (MW)	346	452	306	118
% in operation/admitted	78%	97%	83%	15%



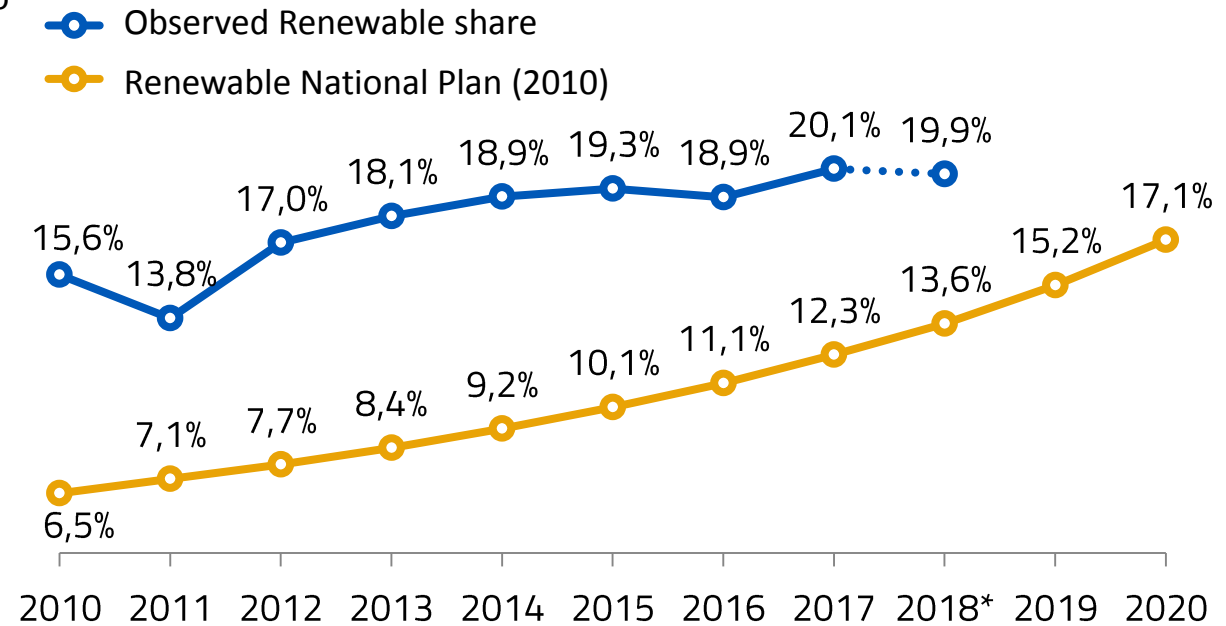
RES IN HEATING SECTOR: CURRENT TREND

- The main contribution is due to **biomass** (8,2 Mtoe in 2017) and in particular **firewood** and **pellet** for **domestic** heating. Operating devices are over **7 million**, with an **annual market** around **0,2-0,4 million** of devices (only 25% increasing the stock)
- **Heat pumps** for heating play a relevant role (2,7 Mtoe). Operating heat pumps are **19,5 million**, with an annual market of **1-1,5 million** (only 15% increasing the stock)
- From an economic point of view, RES-H is mainly driven by the **relatively low cost of energy sources**, also due to **fiscal measures** (tax exemption on biomass and reduced VAT rate) rather than **incentives on new devices** (heating account, fiscal deductions, white certificates)

Total and RES Gross Final Consumption [Mtoe]



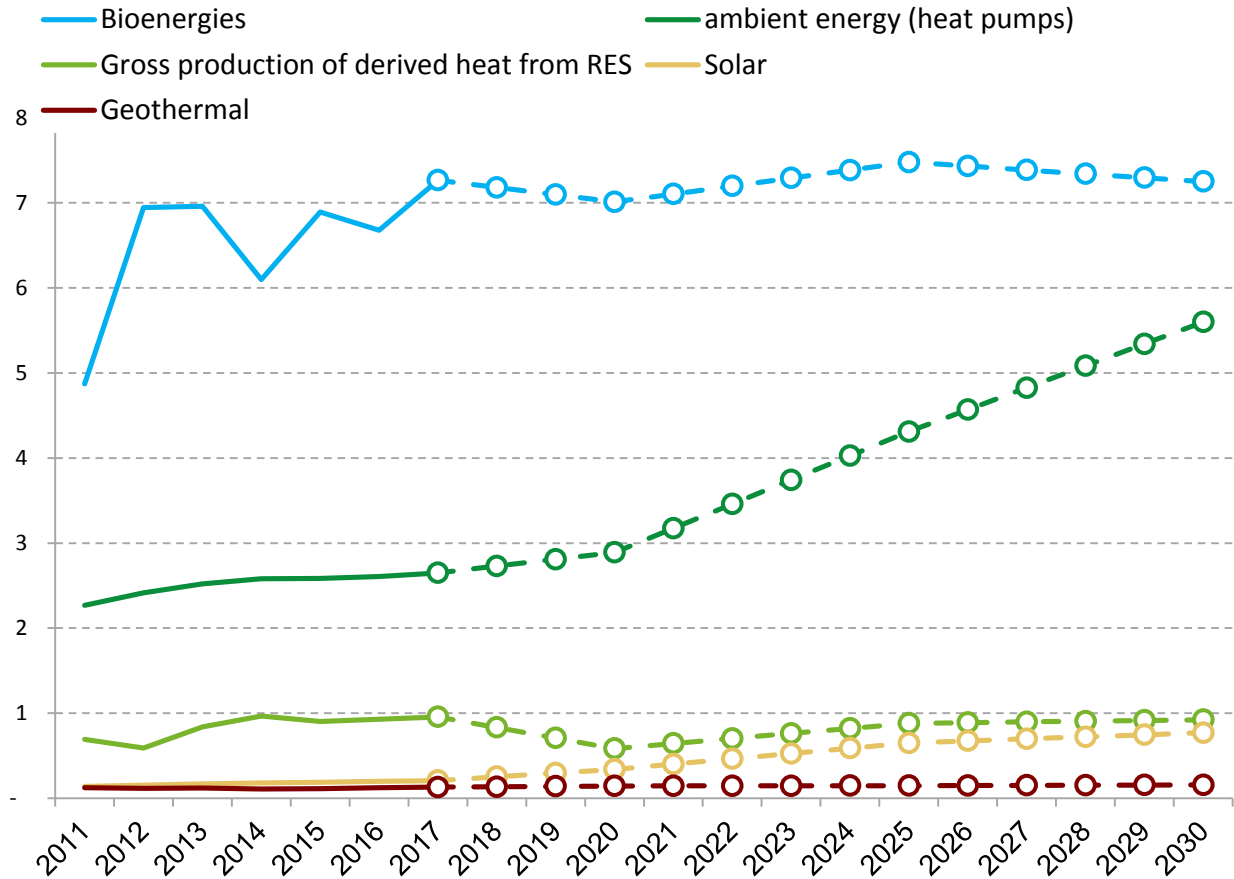
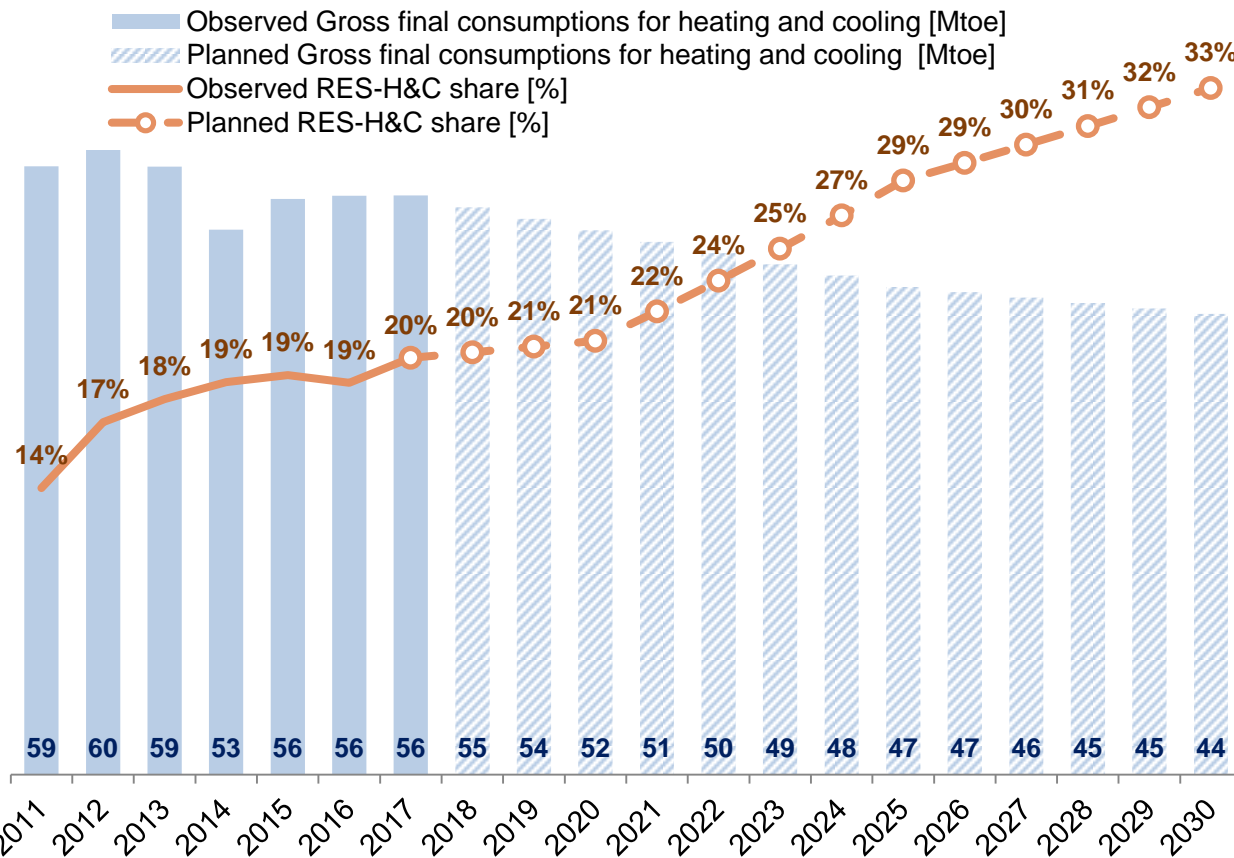
Observed RES share and 2020 target [%]



EVOLUTION OF RES-H: THE ROAD TOWARDS 2030

- The **National Energy and Climate Plan (NECP)**, Stable contribution of biomass (air quality constraints)
- Sharp increase of ambient energy use, up to around 5,5 Mtoe

RES trajectories in Heating and cooling sector until 2030 [Mtoe]



THE ROAD TOWARDS 2030: MAIN GUIDELINES



- The first resource to focus on is **energy efficiency** and **energy savings**, in order to reduce thermal consumption, especially in the **residential** sector.



- Strengthening the regulation on **mandatory RES share on buildings** might be important.

- **Heat pumps** have a **key-role**, also for the **electrification** of thermal consumptions.

- **Solar thermal** technologies, not developed so far, may be enabled (but in some circumstances they have the competition of the **photovoltaic-heat pump coupling**)



- Italy has a problem of high levels of particulate matter, so the role of **biomass** for heating sector should be revised. But there would be a really interesting market of replacement of old devices with new technologies more efficient and with lower emissions



- **District heating** could be developed, mainly considering current networks, enabling **synergies** between **renewables**, **waste** and **high efficiency cogeneration**

- The possibility to include **cooling** in RES counting, and how, is currently under investigation at UE level

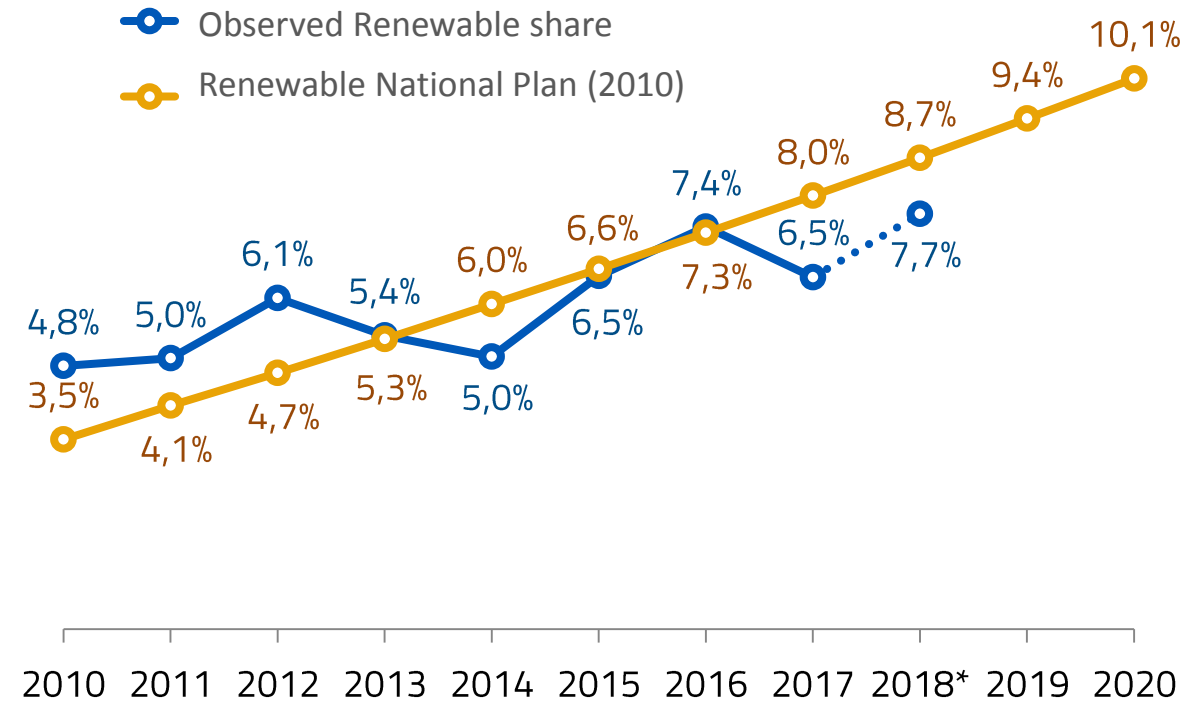
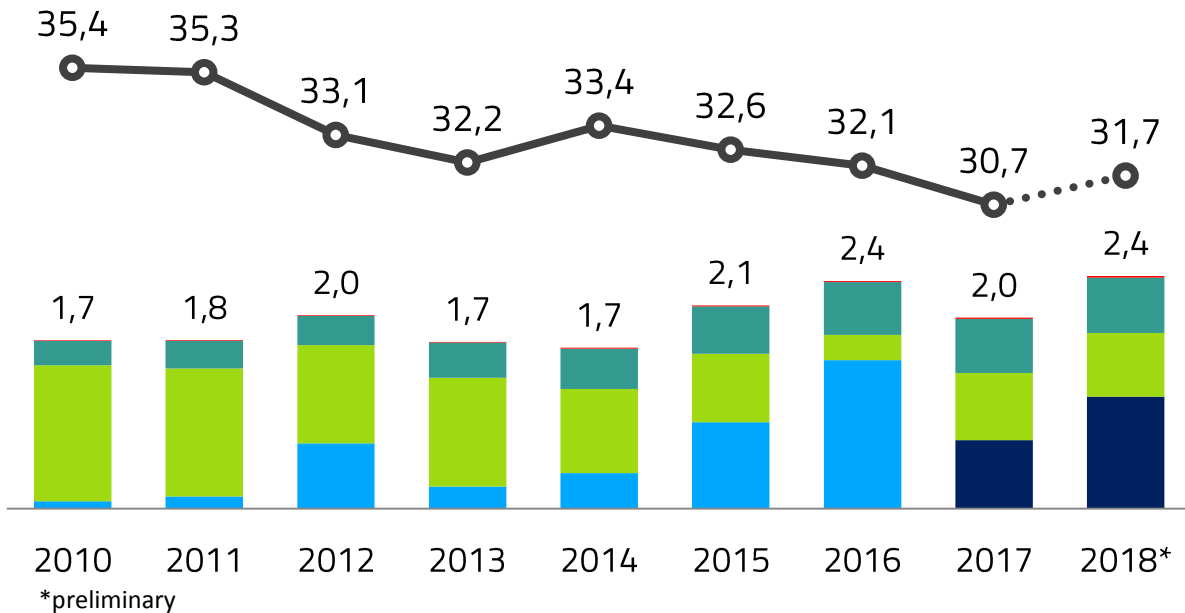


RES-T IN TRANSPORT: CURRENT TREND

- RES evolution in the transport sector is mainly driven by **biofuels blending obligation** (7% in 2018)
- In **2017** the **RES share was 6,5%** considering the multipliers (“x 2” for *double counting biofuels*; “x 5” for RES electricity for roads; “x 2,5” for RES electricity for rails)
- Preliminary estimates for **2018** indicate an **increase of biofuels injection** with respect to 2017, in particular for **double counting**

RES target in transport (with multipliers) [Mtoe and %]

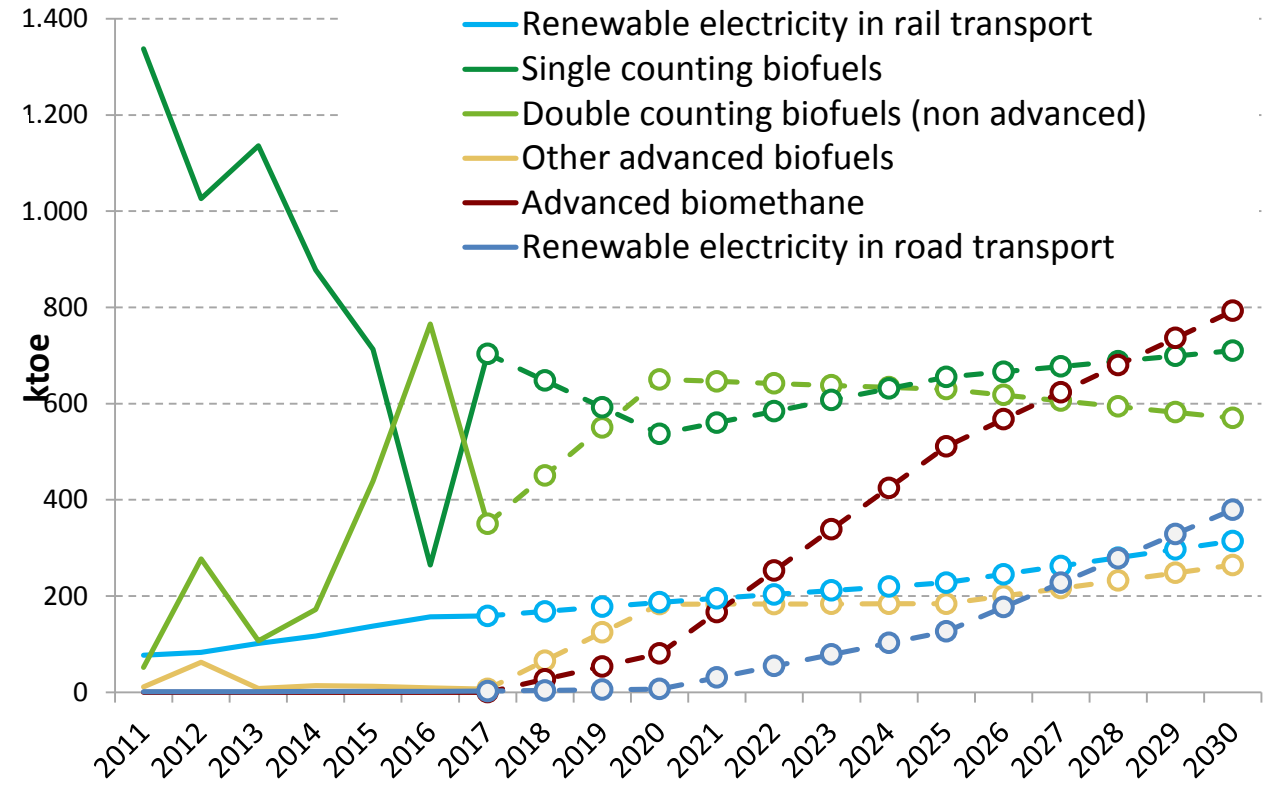
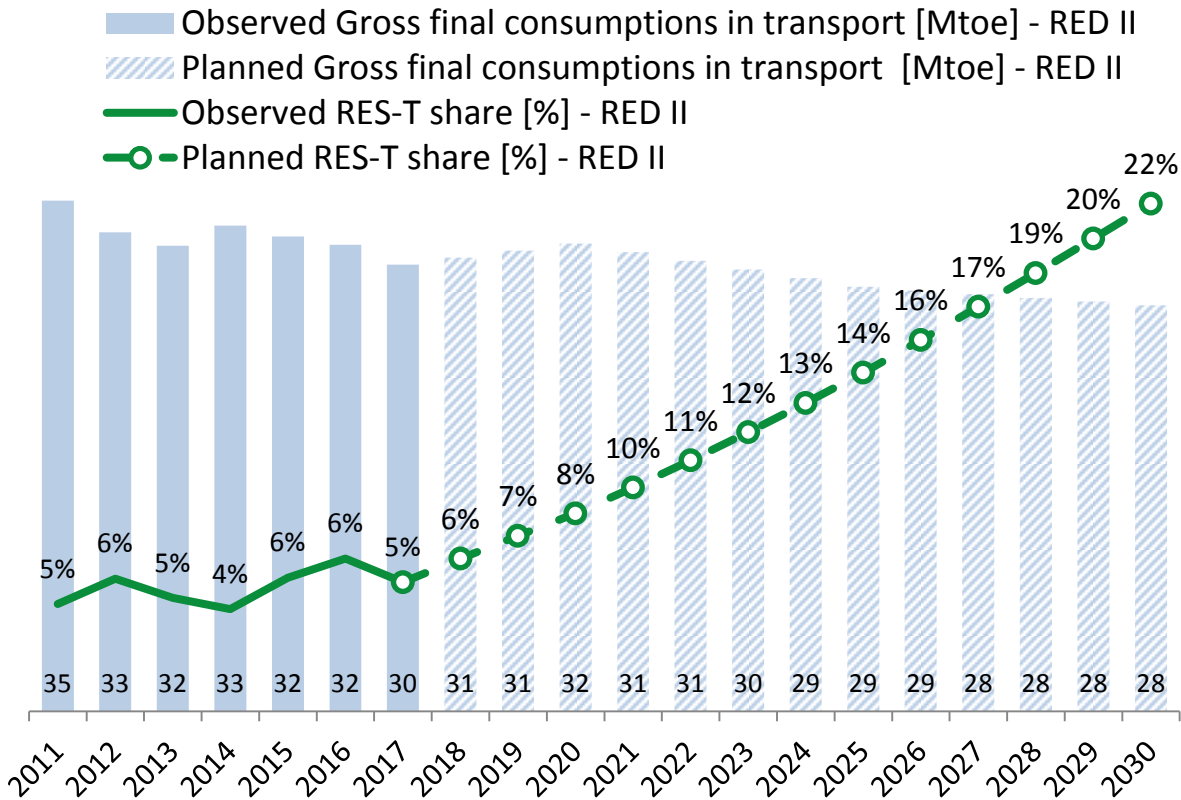
- Res electricity on road
- Single counting biofuel
- Double counting biofuels - ILUC
- Other Res electricity
- Double counting biofuels - NON ILUC
- GFC in transport



EVOLUTION OF RES-T: THE ROAD TOWARDS 2030

- The **National Energy and Climate Plan (NECP)**, Obligation higher than RED II art 25 in order to ensure the achievement of overall RES share of 30%;
- Advanced biofuels will reach around 8% (more than twice the RED II target) thank to the contribution of biomethane (planned to cover 75% of advanced biofuels);
- Strong growth of RES electricity consumed by road vehicles (up to 380 ktoe).

RES trajectories in transport until 2030



THE ROAD TOWARDS 2030: MAIN GUIDELINES



- **Biomethane** is identified as an important alternative fuel for the transport sector. The **M.D. 2/3/2018** sets incentives, having a duration of 20 years, based on the emission of blending obligation certificates. The certificates can be sold to oil companies subject to the blending obligation mechanism. For **biomethane** and **biofuels** from **wastes and non food feedstock (advanced)**, certificates are bought by GSE at a **fixed price**.



- A relevant role expected to be played in 2030 by **electric and hybrid (plug-in) vehicles**. Improvement of **batteries performance**, decrease of the **cost**, development of **recharge infrastructure**, will allow an increase of the penetration of such vehicles. Legislative Decree 16/12/2016, transposing the Directive on Alternative Fuel Infrastructure, foresees an increase of recharge stations from the current 2.900 up to at least 6.500 in 2020.



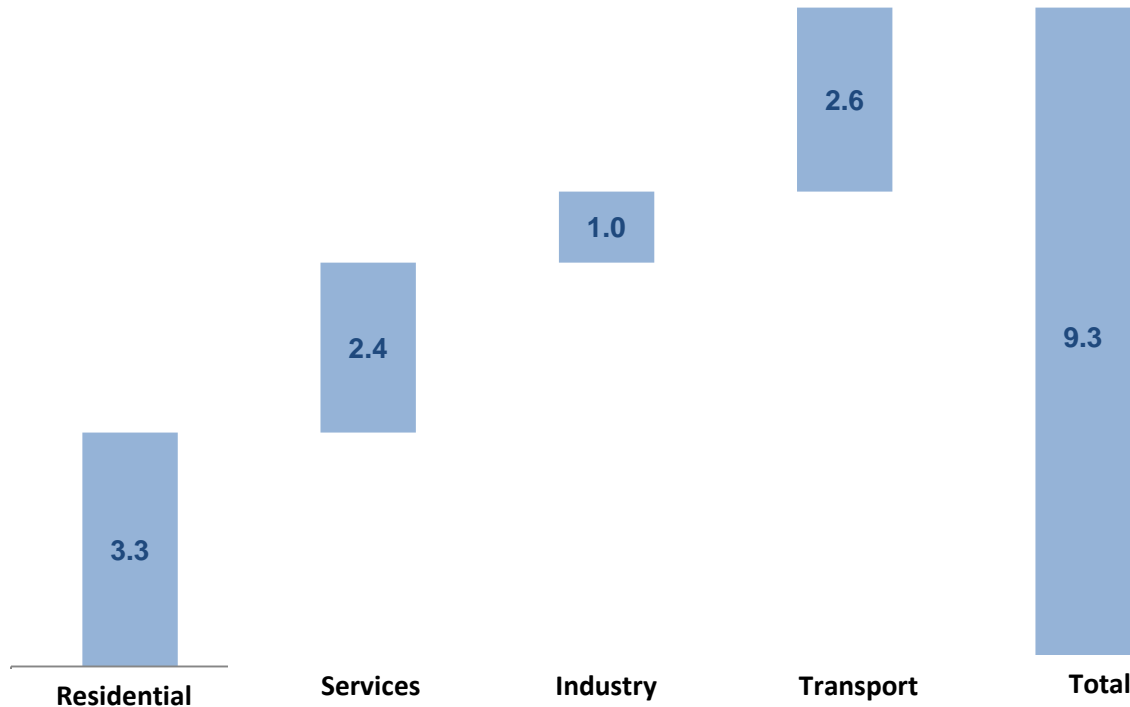
- **Not only technologies**. To reduce consumption in the transport sector, other strategies will also be very important: **“avoiding”** (**smart working, online services**, etc.) and **“shifting”** (upgrading of **local public transport, intermodal freight transport, intelligent transport system, car-sharing, car-pooling, cycling**, etc.)

EVOLUTION OF EE: THE ROAD TOWARDS 2030

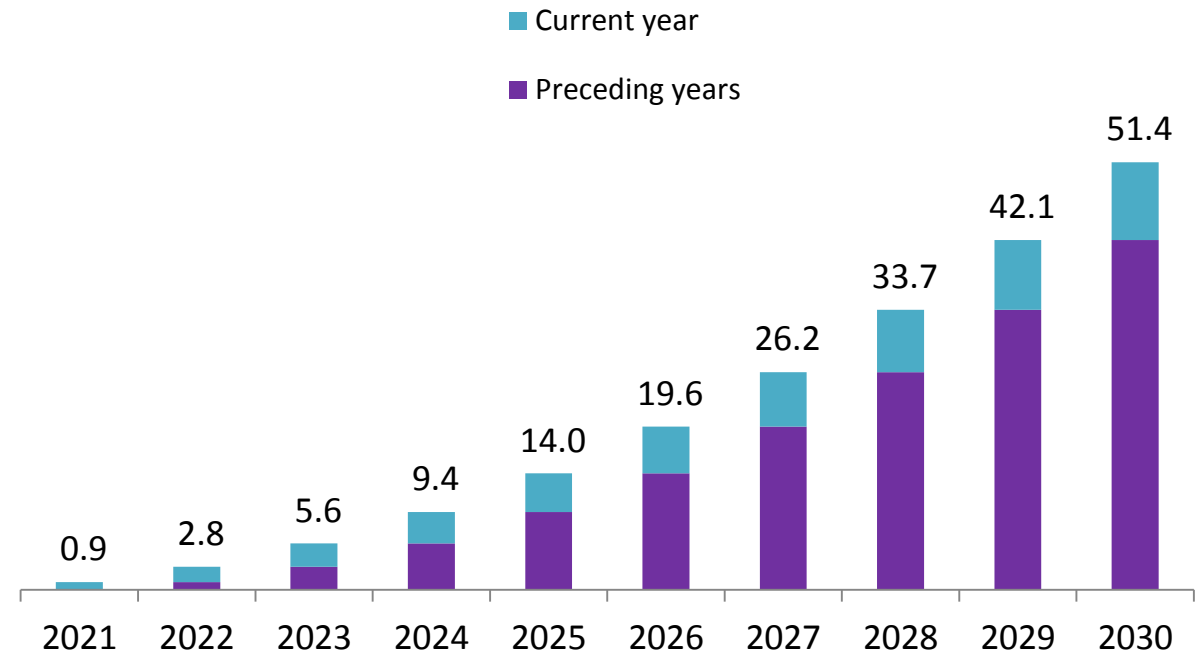
The **National Energy and Climate Plan (NECP)**, the main contributions on energy efficiency are expected from civil sector, with 2030 savings equal to 5.7 Mtoe, related to the residential sector (3.3 Mtoe) and Services (2.4 Mtoe). Moreover, a relevant contribution is expected in transport (2.6 Mtoe)

Cumulative savings in the period 2021-2030 **sum up to 51.4 Mtoe**

2030 savings with active policies (Article 7) by economic sector (Mtoe)



Cumulative 2021-2030 savings with active policies (Article 7) (Mtoe)



ITALIAN EXPERIENCE: LESSON LEARNED

Tips for efficient RES development:

- **Stable framework**, guarantee continuity and “certainty” of RES policies, in a **long-term perspective**
 - Set **long term RES targets**
 - Promote a **progressive** development, consistent with the **national context**
 - Define **efficient authorization procedures**
 - Promote a consistent development of the electricity **grid**
 - Minimize country/investment **risk**, encouraging foreign investors
- **“Tune” incentives** finely
 - Incentive may **distort** the market: too generous tariffs can determine **speculative behaviors** rather than development
 - Set **fair tariffs**, if necessary and plan **progressive reduction**
 - Promote **competitive schemes**, like auctions
- **Monitor** results:
 - RES deployment and track towards targets
 - Provide **feedback to policy makers** and eventually adjust support schemes