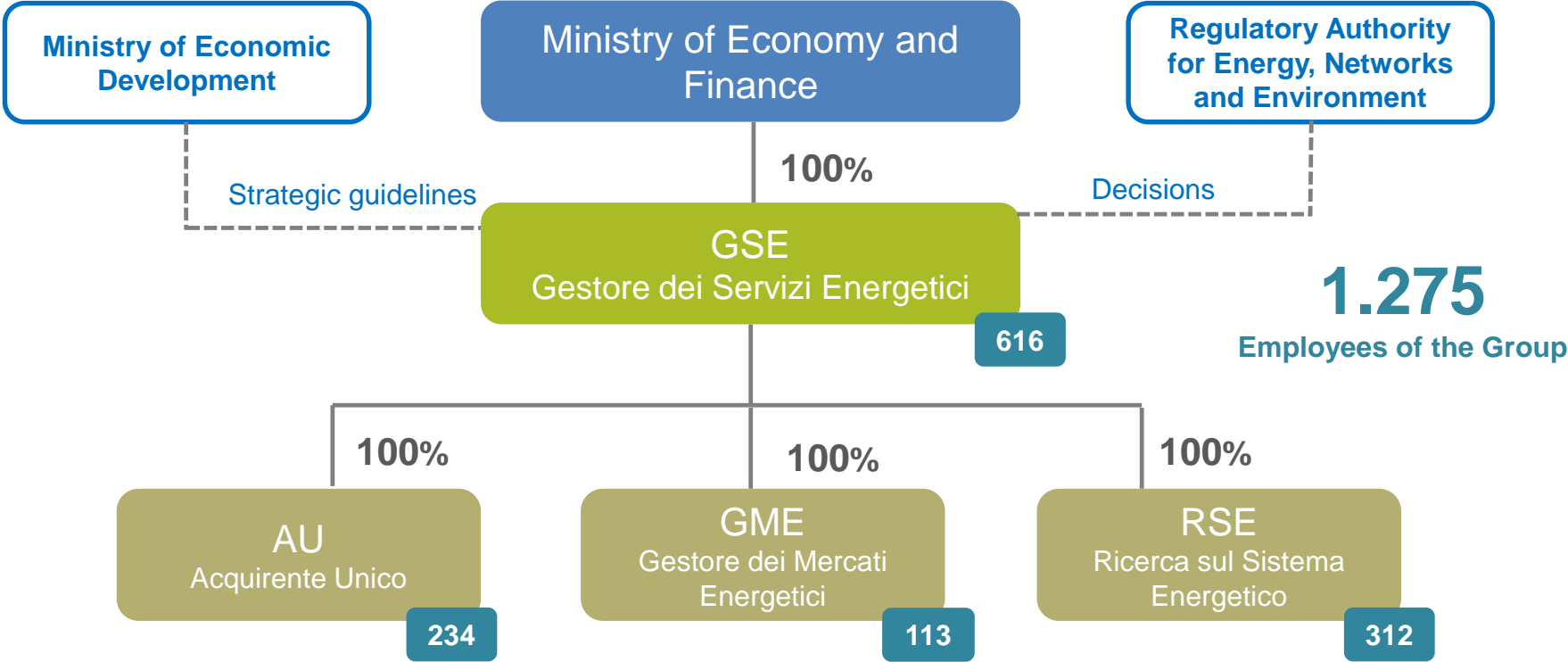


# Self- consumption schemes in Italy

13th November 2019

# Who we are



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

# What we do



## INCENTIVES AND PROMOTION OF ELECTRICITY FROM RENEWABLE SOURCES

- Qualifying RES plants
- Granting incentives, collecting and selling energy, “green origin” certification
- Metering and forecast of energy production



## ENERGY EFFICIENCY, RENEWABLE ENERGY FOR HEATING & COOLING

- White Certificates
- High-efficiency CHP
- Heating & Cooling support scheme



## SUPPORT SCHEMES FOR TRANSPORT (BIOFUELS AND BIOMETHANE)

- Biomethane
- Advanced biofuels



## ON SITE VERIFICATIONS OF PLANTS

- Renewables plants
- Energy efficiency and heating and cooling projects
- High efficiency CHP



## SUPPORT TO CITIZENS, COMPANIES & PUBLIC ADMINISTRATIONS

- Support to PA
- Promotion and communication
- Sharing of best practices



## INSTITUTIONAL ACTIVITIES AND OTHER SERVICES

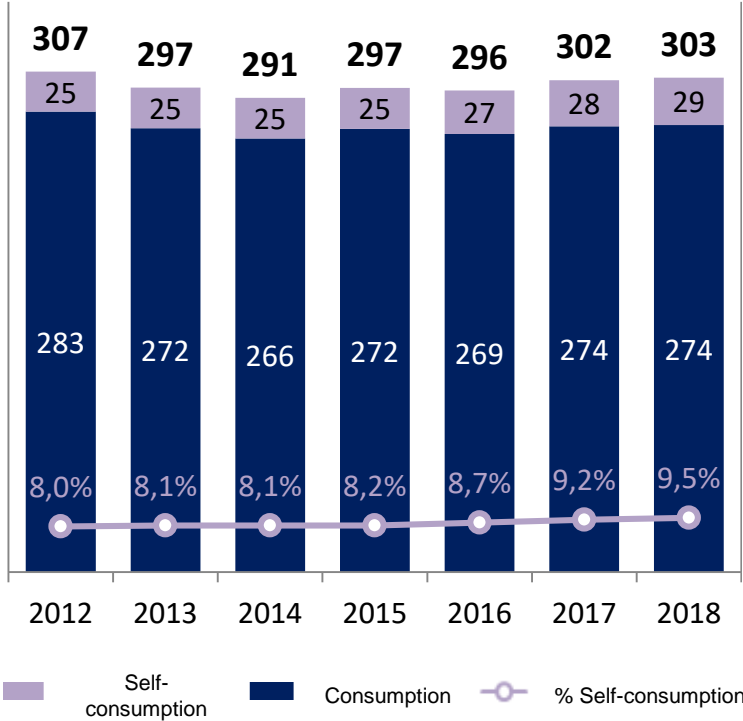
- Studies and Statistics, support to elaborate Government Plans and documents (i.e. NECP)
- ETS auctions to sale the Italian CO2 allowances



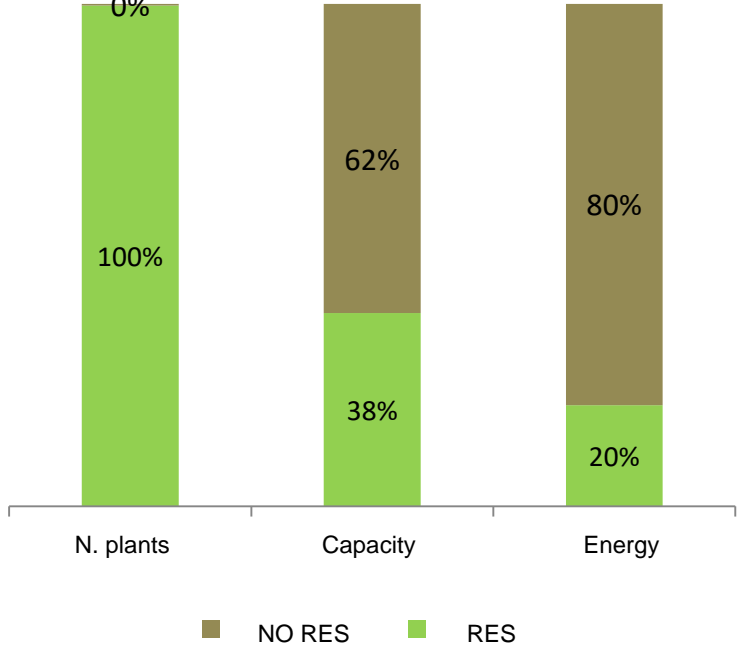
# Self-consumption in Italy

- Self-consumption accounts for **29 TWh** in 2018 (almost **10%** of national consumptions) - increasing trend of 1 TWh/year
- Only **20%** of self-consumption is from **RES plants** (in terms of energy)
- **FV** is the **main RES source** for self-consumption, **75%** in 2017 (increasing trend)

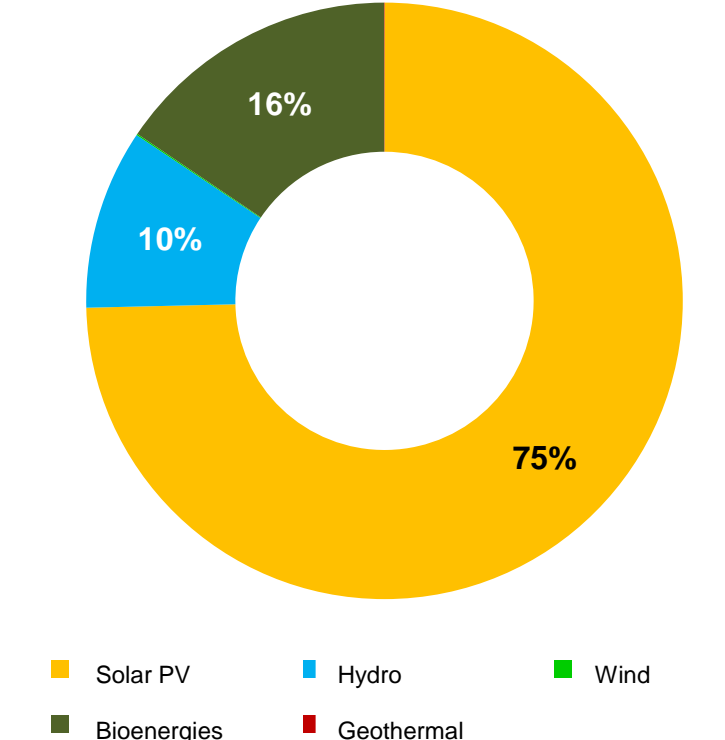
**Consumption & Self-consumption**



**RES vs NO RES Self-consumption in 2017**



**Source of RES Self-consumption in 2017**



# Distributed generation: PV plants in 2018

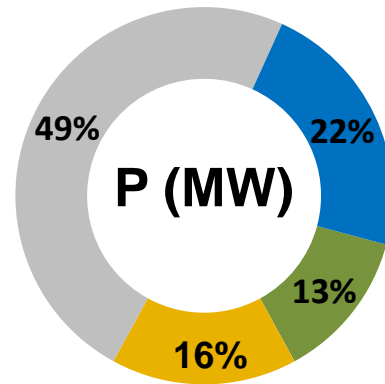
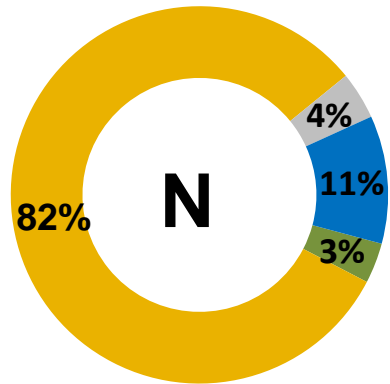
822.301 plants - 20,1 GW

Size (kW)	n°	MW	% n°	% MW
C<=3	279.681	760	34%	4%
3<C<=20	476.396	3.445	58%	17%
20<C<=200	54.209	4.244	7%	21%
200<C<=1.000	10.878	7.413	1%	37%
1.000<C<=5.000	948	2.328	0%	12%
P>5.000	189	1.917	0%	10%
<b>Total</b>	<b>822.301</b>	<b>20.108</b>	<b>100%</b>	<b>100%</b>

Regional distribution (in terms of installed capacity)



## Sectoral distribution



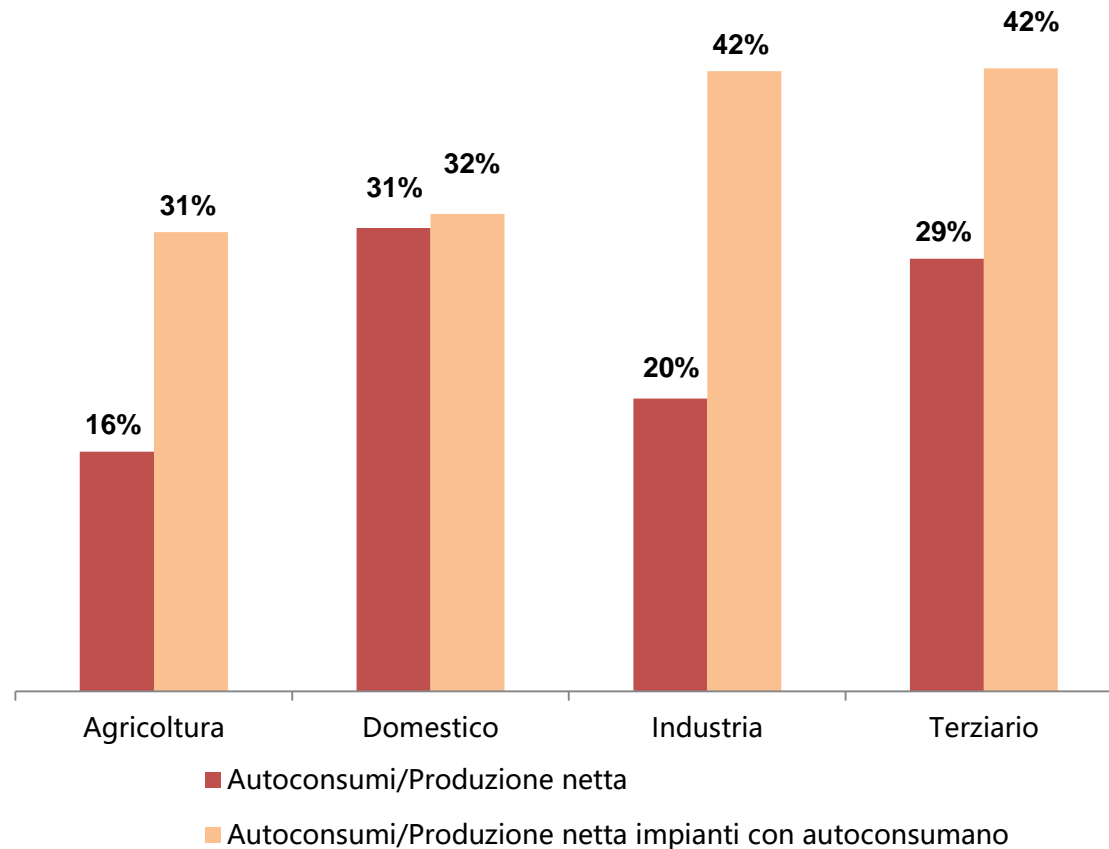
- Agriculture
- Residential
- Industry
- Services

Source: GSE Statistical Report 2018

# PV Self-consumption

- In 2018 PV self-consumption accounts for **5,1 TWh**, around **38%** of PV self-consuming plants generation
- Residential self-consumption is around 30% of generation, while in industry and tertiary sector self-consuming plants reach higher levels

## Sectoral distribution for PV self-consumption



# Experience..so far

- **Legislative Decree 79/99:** general system charges paid according to withdrawn electricity.
- **Law 99/09:** general system charges paid according to consumed electricity (with some exceptions for simple self-consumption systems and Users Internal Networks).
- **Law-decree 91/14 and Law 116/14:** exonerated systems pay only 5% of variable part of network tariffs and general system charges for self-consumed electricity (+ general system charges according to withdrawn electricity).
- **Law 19/2017** (so called “Milleproroghe”), in compliance with Commission Guidelines on State Aid and the decision received from DG-COM in May 2017, recently re-established for all consumers the payment of network and general systems charges according to the electricity withdrawn from the network.

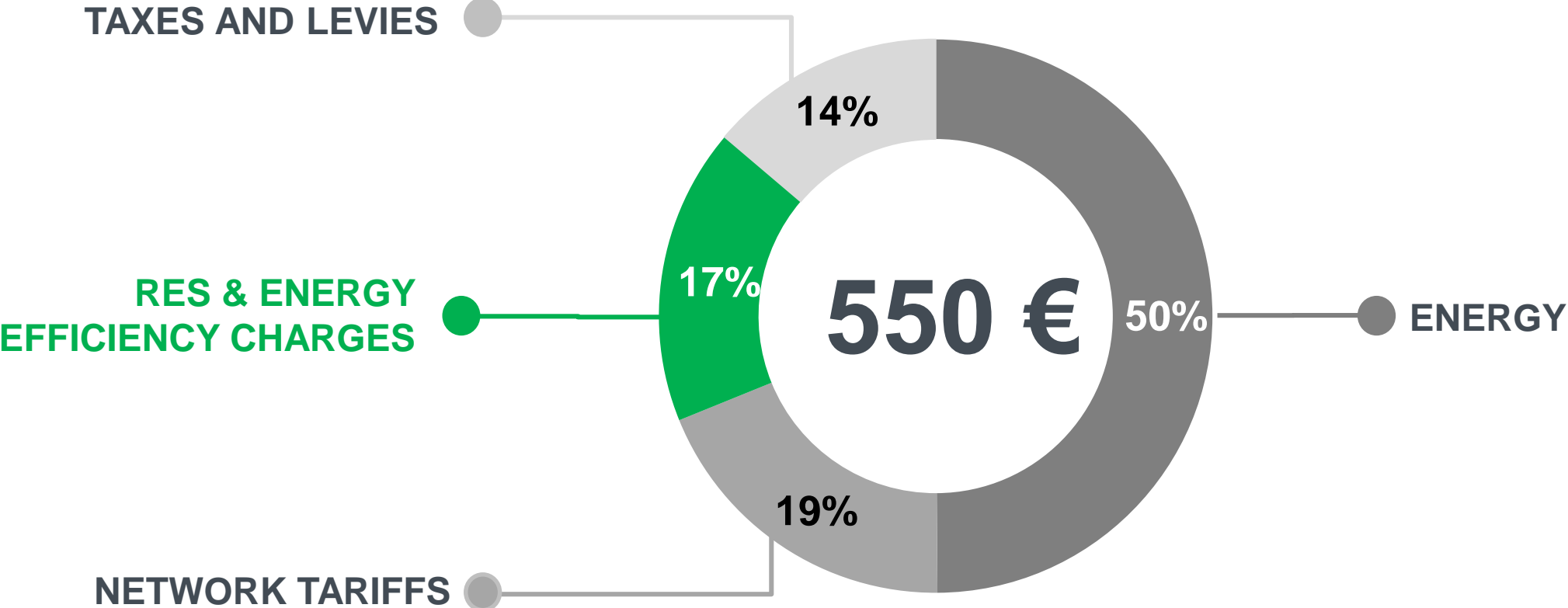


# Revenues and support

- **Indirect support:** Billing savings with regard to the variable part of network tariffs and general system charges paid for electricity withdrawn from public networks + tax deduction (for small PV plants installed at household buildings)
- **Direct support:**
  - ✓ PV plants that benefit of 4<sup>th</sup> and 5<sup>th</sup> feed-in scheme receive a premium rate for the quota of energy produced and self-consumed.
  - ✓ Ministerial Decree 4 July 2019: new self-consumption premium tariff (10 €/MWh) for plants <100 kW on buildings

# Electricity bill and general system charges

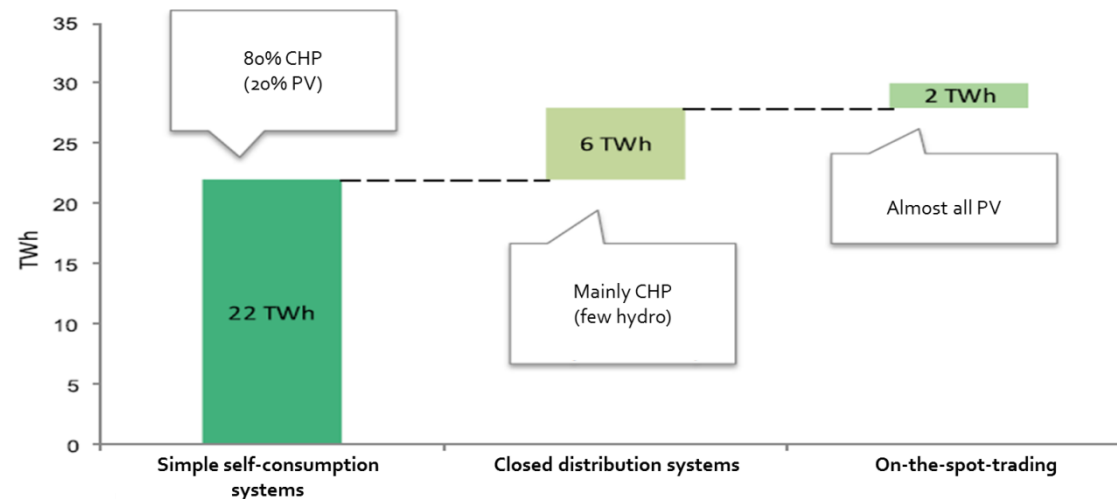
ANNUAL ELECTRICITY BILL FOR A STANDARD FAMILY, 2018: around 200 €/MWh



Estimated annual consumption of 2.700 kWh/anno

# Self-consumption allowed configurations

- **Closed distribution systems - SDC** (also defined in EU Directive 2009/72): systems whose aim is to distribute electricity through private networks, within an industrial, commercial or shared services site.
- **(Simple) Systems of Production and Consumption**: systems whose aim is to regulate the consumption, storage and sell of electricity which is generated within the same system where it is consumed or sold.
- **On the spot trading**: is a particular self-consumption system (managed by GSE) aiming to facilitate market access for small installations.



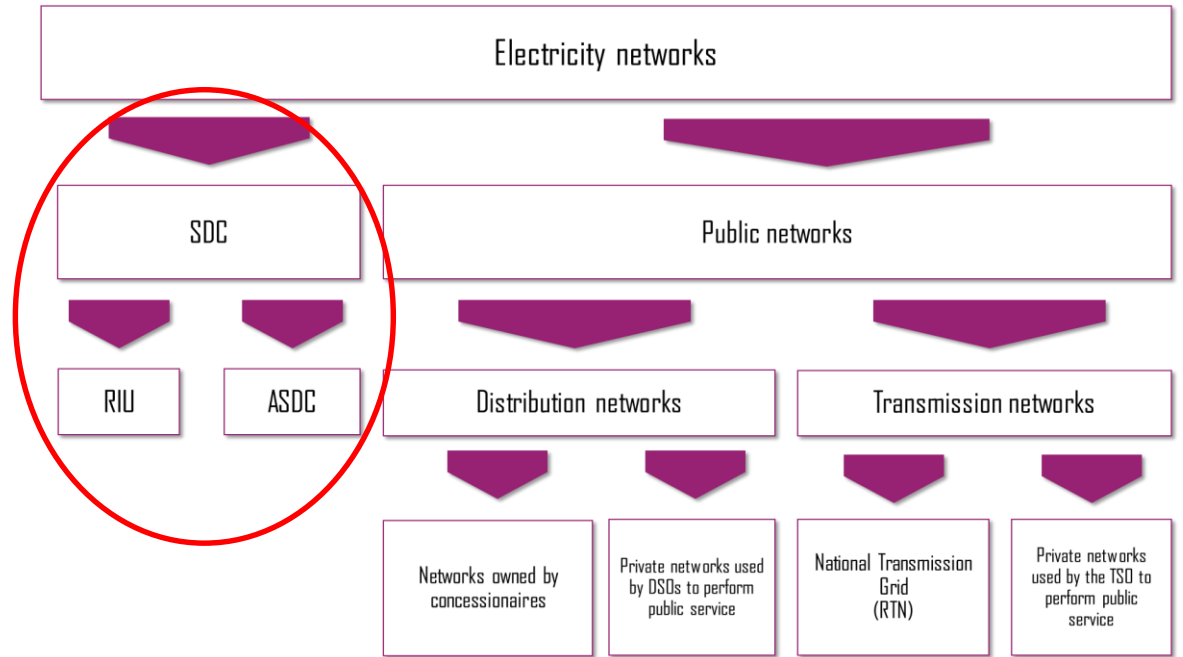
# Closed distribution systems (SDC)

## EXAMPLES

- Registered Users Internal Networks (RIU), as established by Law 99/09
- Other internal networks (ASDC)

## MAIN FEATURES

- Confined geographically territory;
- 1 or more production unit and consumption unit (mainly industrial unit);
- One private network operator (can be different from plants owner and consumers);
- One private electrical connection between generation plants and consumers aiming to distribute electricity within the system;
- One or more connection points with public network.



# Closed distribution systems (SDC)

## RIGHTS & OBLIGATIONS

- The owner of CDS (**SDC Operator**) has generally same rights and obligations of DSOs (i.e. in terms of third party access, non-discriminatory access to the market and network security).

### SDC operator duties towards the final customers

- **Connection**
- **Metering**
- **Network and system charges**
- **Retail market**

- SDC Operator autonomously defines tariffs for connection, transmission, distribution and metering services for connected plants and consumers (may differ from TSOs/DSOs' ones).
- Regulated dispatching tariffs are paid from consumers connected to SDC according to the overall electricity that is withdrawn.
- SDC operator has to divide system charges costs due by the entire SDC and then this value must be distributed amongst all the final users.
- The final users connected to a SDC have the right to access the electricity market with the same conditions as a client connected to the public network a

# (Simple) Systems of Production and Consumption

## EXAMPLES

- On the spot trading;
- Self-producers (included historical cooperative or consortium);
- RES/ CHP systems (SEU) or other systems.

## MAIN FEATURES

- One or more producer and one or more consumer connected by a private connection;
- One private electrical connection between generation plants and consumption units (the transport of energy from the generator to the consumer does not constitute distribution or transmission activity);
- One (or more) connection points with public network;

## RIGHTS & OBLIGATIONS

- Transmission, distribution and dispatching tariffs are paid according to withdrawn electricity from public network (regulated tariffs).
- Private contract between producers and consumers to regulate self-consumed electricity.

# On-the-spot trading (SSP mechanism)



The *on the spot trading* mechanism provides economical compensation (settled by GSE) to eligible power plants operators for the amount of electricity they inject into the grid but cannot be able to instantaneously consume. In other words, the electricity grid operates as a “**virtual energy storage**”.

# On-the-spot trading

## Who can access

- Power plants **up to 500 kW** fuelled by **renewable** sources which came into service **after 31st December 2014**
- Power plants **up to 200 kW** fuelled by **renewable** sources which came into service **before 31st December 2014**
- High efficiency **cogeneration** plants **up to 200 kW**

## Key points

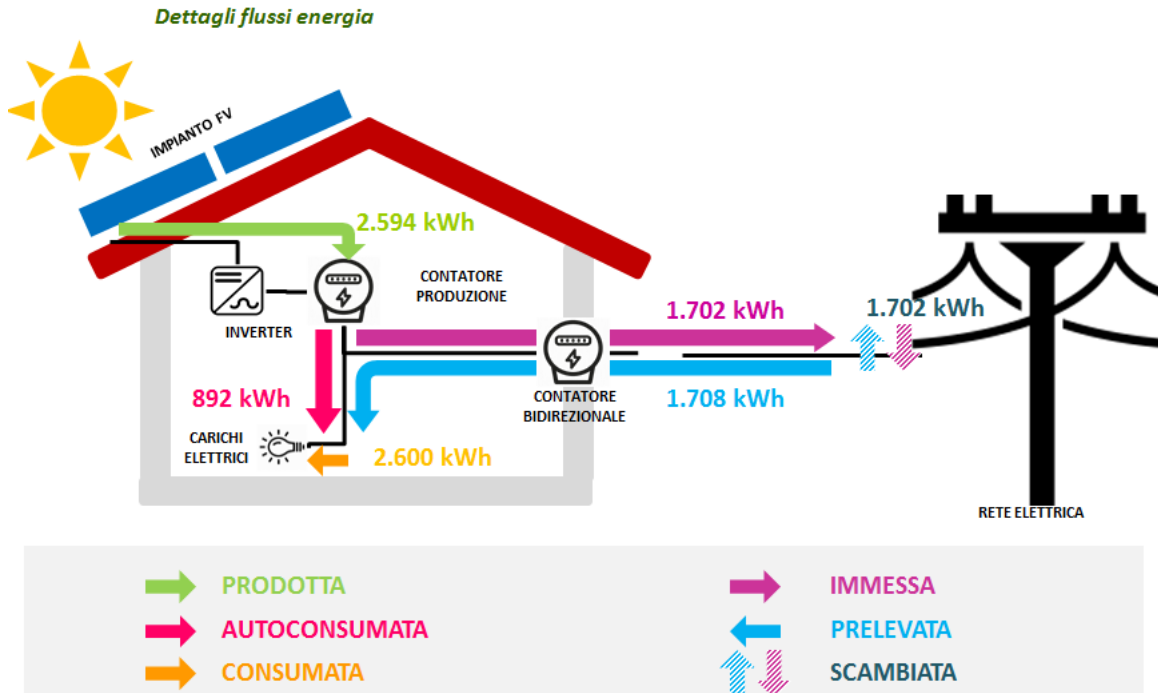
Producers receive an **energy grant** that is the sum of two contributions, “energy quota” and “services quota”:

- The “**energy quota**” allows the users of this service to receive at maximum an amount of money equivalent to the costs they pay for the energy quota of the electricity withdrawn. If the value of the power fed into the grid is higher than the energy costs, the surplus can be paid by GSE to the users of service or, in alternative, can be settled in the first year when the opposite situation occurs (deficit).
- The “**services quota**” (network tariff and general system charges) allows the users of this service to receive an amount of money, equivalent to the variable costs they pay for using the grid for the electricity exchanged (this system cost remains in charge of customers, is a burden on final customers). There is a maximum value for this cost ( $C_{usf}$ ) that can be granted to plants, according to technologies and sizes, in order to avoid advantages in respect of RES incentives and to avoid too high burden.



# On-the-spot-trading: energy and cash flows

EXAMPLE: PV PLANT OF 2 KW AND FAMILY YEARLY CONSUMPTION= 2.600 KWH



$$C_S = \underbrace{\min [O_E ; C_{EI}]}_{\text{"Energy Quota"}} + \underbrace{C_{USf} \times E_S}_{\text{"Services Quota"}}$$

$O_E$  = energy quota (€) paid by the user for the electricity withdrawn ( $E_W$ )

$C_{EI}$  = value (€) of the electricity fed into the grid ( $E_f$ )

$C_{USf}$  = unit flat annual price (c€/kWh), defined by AEEGSI

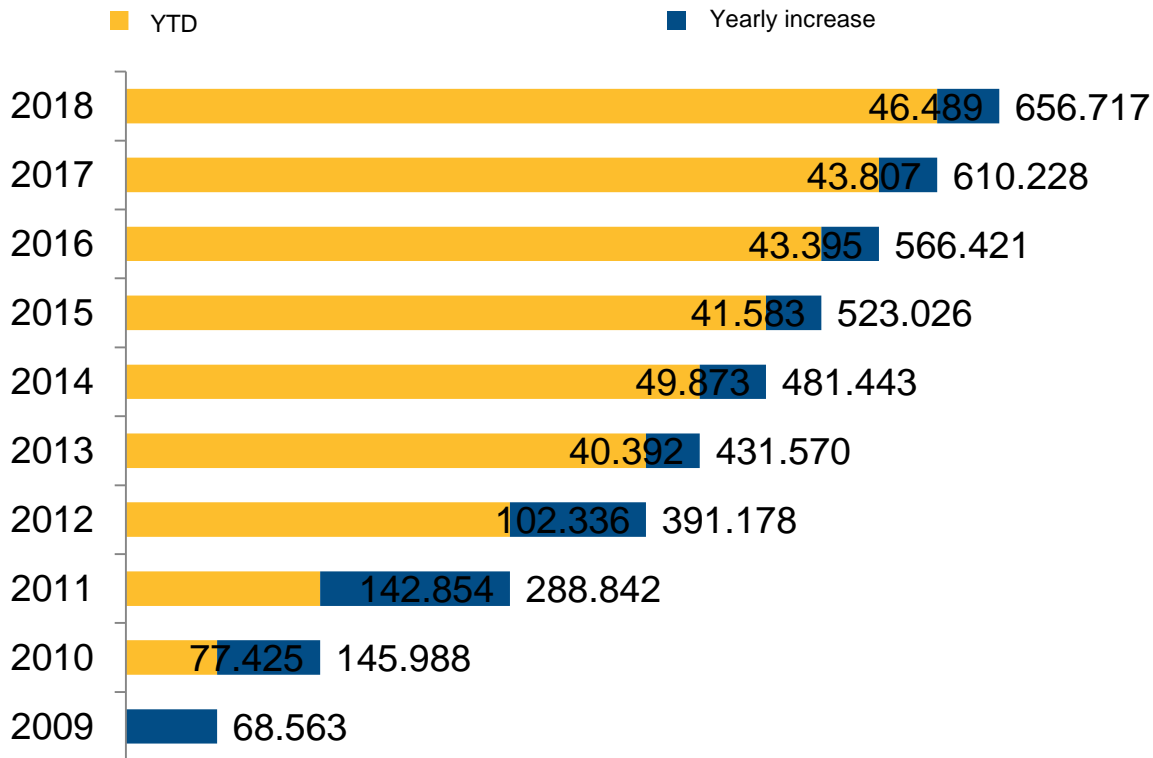
$E_S$  = electricity exchanged (kWh) =  $\min [E_f, E_W]$

**Energy Grant:** The total electricity withdrawals are regulated by the retail service companies; furthermore a contribution is given by GSE to guarantee that the users of this service receive an equivalence between what they pay for the power withdrawn from the grid and the value of the power injected into the grid -> the final result is like having "savings on the electricity bill".

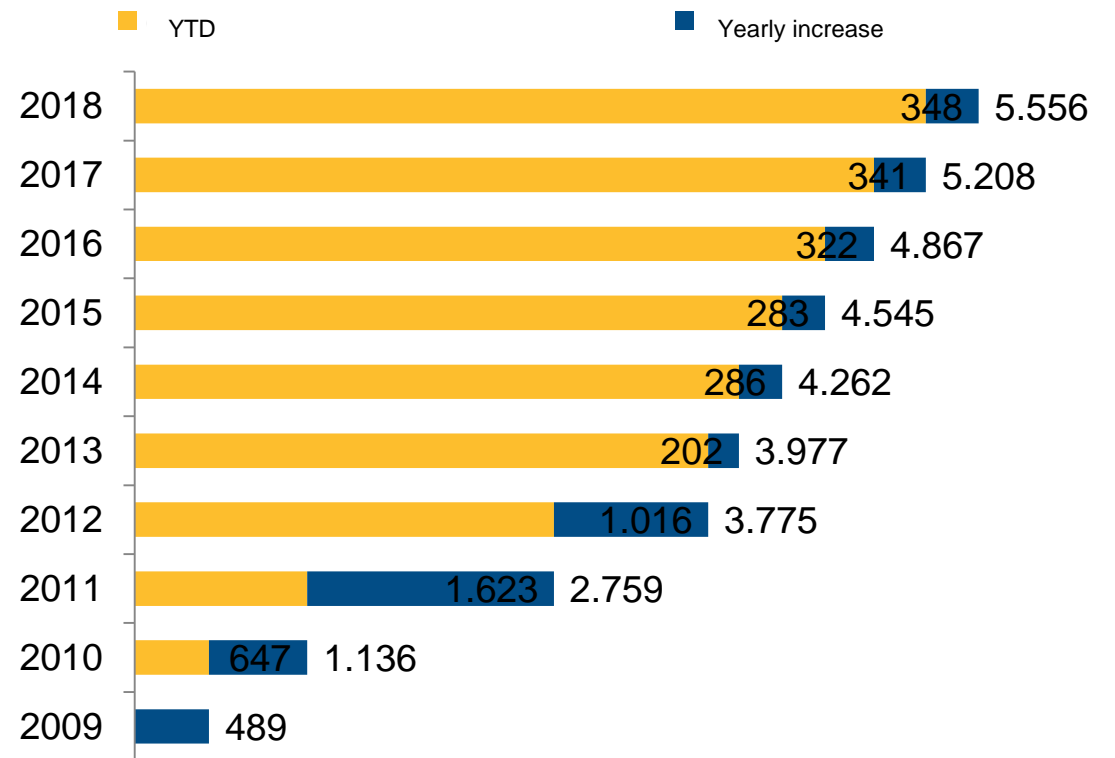
# On-the-spot-trading: results

- Over **650.000** plants with an installed capacity of **5.556 MW** (99,9% PV plants), + **46.000 plants** in 2016 **incremento** (additional capacity of **348 MW**)
- Electricity exchanged = **2,4 TWh**, energy grant amounts to **268 mlneuro**

## Number of plants under SSP scheme



## Installed capacity [MW]



Source: GSE Annual Report 2018



# The path to 2030 targets

## Clean Energy Package

Active role for customers, at the centre of energy transition:

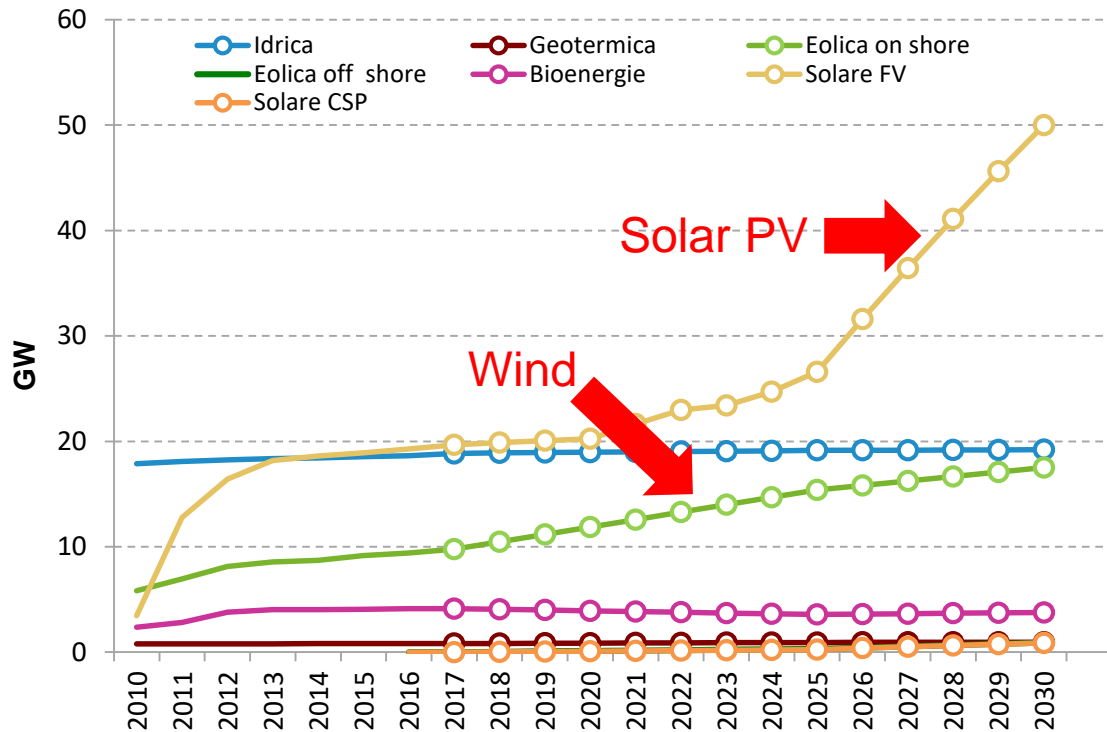
- Citizens energy communities (CEC)
- Renewable energy communities (REC)
- Renewable self-consumers (jointly acting)



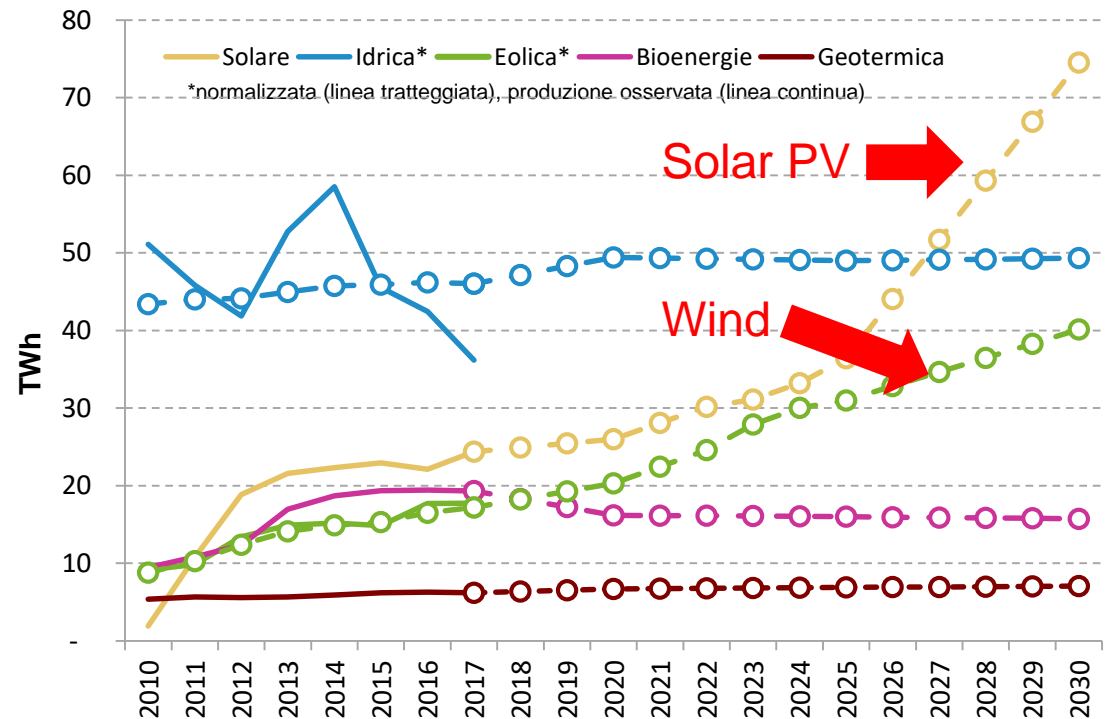
# NECP: Targets for RES

- RES increase up to **93 GW at 2030, +40 GW vs 2017**. Main addressed sources: **PV plants (+30 GW vs current 20 GW)**, and **wind plants (+8 GW vs current 10 GW)**.
- RES energy up to **187 TWh at 2030** (113 TWh in 2017). Mainly from **PV plants (+50 TWh vs current 24 TWh)** and **wind (+23 TWh vs current 17 TWh)**.

## Expected RES capacity growth at 2030



## Expected RES energy growth at 2030



# NECP: self-consumption

- ❑ Promotion and diffusion of self-consumption: development of enabling policies
  
- ❑ Reorganization and rationalization of self-consumption configurations
  
- ❑ **Small RES installations (<1MW):**
  - ✓ billing savings will continue to be used as indirect support scheme (same support at the beginning for collective self-consumption and energy communities)
  - ✓ evolution of on-the-spot trading mechanism towards a premium for plants using storage systems to increase self-consumption (and providing security services to MV and LV networks)
  - ✓ enforcement of the obligation to integrate RES installations on buildings.

# GSE support PV self-consumption

GSE has developed a web portal: [PV self-consumption portal](#).

## Main objectives:

- **Grant availability and use of information** concerning benefits and support schemes
- **Evaluate the potential** of an installation
- **Support and facilitate** the beginning of **projects**



# Thanks for the attention

[federica.ceccaroni@gse.it](mailto:federica.ceccaroni@gse.it)