Economic instruments and transition pathways to a low-carbon economy in the industrial sectors

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FEDERMANAGER

Italy is engaged in a process of decarbonisation in accordance with EU Targets through…

…Very ambitious reduction of GHG emissions for the energy sector to 2030

EU imposes a 43% cut for ETS sectors and 33% for non-ETS (base year 2005)

Italy plans to do more for ETS in the new energy strategy to be approved in nov-17

National Integrated Climate Energy Plans must be submitted to EU by 2018

GHG EMISSIONS REDUCTION IN ITALY					
Italian Energy Strategy 2017 (SEN)	Target 2020	Forecast 2020	Target 2030	*Scenario BASE 2030*	*Scenario Policy Intermediate 2030*
ETS	21%	≈ 38%	43%	≈ 44%	≈ 48%
Non-ETS	13%	≈ 17%	33%	≈ 24%	≈ 33%

Base year: 2005

Decarbonization will be obtained through…

MF7

- **Energy consumption mostly coming from more efficiency**
  - ~ 16 Mtep of primary energy saving 2015-2030 → 10% cut
  - At least -1,5% p.a. in final energy demand 2021-2030

- **Increase of Renewable energies**

  At least 27% on total final consumption 2030
  - Electric: 48 – 50% in 2030 (33,5% in 2015)
  - Thermal: 28 – 30% in 2030 (19,2% in 2015)
  - Transport: 17 - 19% in 2030 (6,4% in 2015)

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MF7 From SEN 2017 Scenario
Policy Intermediate
2030. Targets could be more challenging in the final version of SEN to be released in november 2017
Marghella Francesco; 31/10/2017

Investments are pivotal for the energy transition to 2030

Investments from today to 2030 are estimated in nearly 130 billion €

- 80% in Energy and End uses sectors
  1. Oil&Gas
  2. Households & Services
  3. Transport
  4. Industry

- 20% in electricity sector
  1. Renewables
  2. Capacity for system stability
  3. Smart grids
  4. Storage

Energy and End uses sectors

Priority given to energy efficiency

- Households & Services
  - Buildings retrofit
    - Private sector: homes (also combined with land security and anti-seismic measures)
    - Public administration
  - Heat pumps
  - Renewables

- Transport
  - New and more efficient vehicles
  - Electric vehicles
  - Public mobility & Sharing mobility

Power sector

HISTORY OF RES-E IN ITALY

ELECTRIC RENEWABLES DEVELOPMENT IMPACT IN ITALY					
	Investments	O&M	Value added	Temporary employed (dir+indir)	Permanent employed (dir+indir)
	Billion €	Billion €	Billion €	Annual Working Units	Annual Working Units
2011	14.1	2.2	7.3	98,000	23,000
2012	12.1	2.9	7.2	91,000	30,000
2013	3.7	3.2	3.7	29,000	34,000
2014	1.6	3.4	2.8	13,000	34,000
2015	1.7	3.5	2.9	15,000	35,000
2016	1.7	3.6	3.0	15,000	35,000

Source: GSE

FUTURE RES-E CAPACITY NEEDS 2017-2030 MF6

- Solar: +16 GW FM1
- Wind: +10 GW FM2
- Other RES: +1 GW

RENEWABLE CAPACITY IN ITALY (GW)					
	Solar	Wind	Hydro	Bioenergy	Geothermal
2010	3.5	5.8	21.9	2.4	0.7
2016	19.3	9.5	22.7	4.2	0.8
2030	~ 35	~ 20	~ 24	~ 4	~ 1

Source: Terna 2010-2016; AIEE elaboration 2030

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FM1 Solar 2017-2030 - 1.1 GW per year, but 9.3 GW installed in one year=2011)
Francesco Marghella; 29/10/2017

FM2 Wind 2017-2030 - 0.7 GW per year, but 80% of the installed capacity today must be revamped-repowered by 2030 due to ageing of plants
Francesco Marghella; 29/10/2017

MF6 First estimates based on SEN 2017 Scenario Policy Intermediate
2030. The final breakdowns from the final version of SEN could be higher
Marghella Francesco; 31/10/2017

Power sector

A new shape for electricity generation

- Nearly 30% of production coming from *Variable Renewable Energy* (VRE) FM3
- Phase-out of coal plants (8 GW disposal planned for 2025)
- Adequacy and security of the system pursued through natural gas capacity

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FM3 In 2015 Solar + Wind production <15% of total production

Francesco Marghella; 29/10/2017

Infrastructures

National electric system

- Smart Grids
- Transnational grid interconnections FM4 FM5
- Storage
  - Seasonal and intra-day
- Electric vehicles charging station

Oil&Gas

- LNG for heavy-duty vehicles and navigation
- Conversions of refineries into bio-refineries

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FM4 The Commission has already set a 10% electricity interconnection target for 2020 but has proposed to extend this to 15% by 2030
Francesco Marghella; 29/10/2017

FM5 Italy is now below 10%
Francesco Marghella; 29/10/2017

What can make investments more attractive

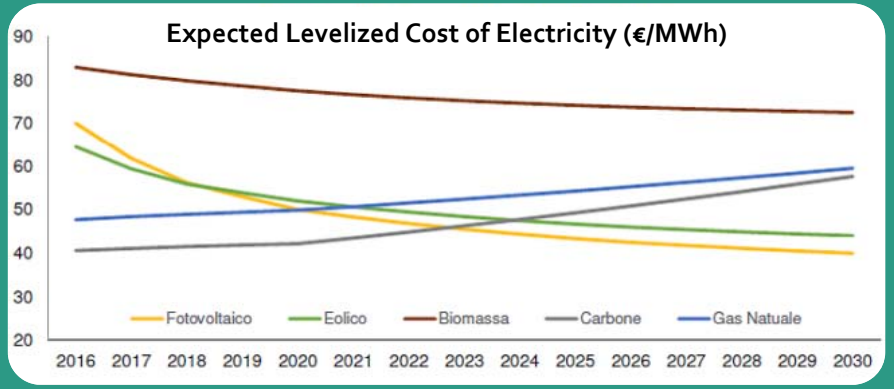
Main drivers

Exogenous

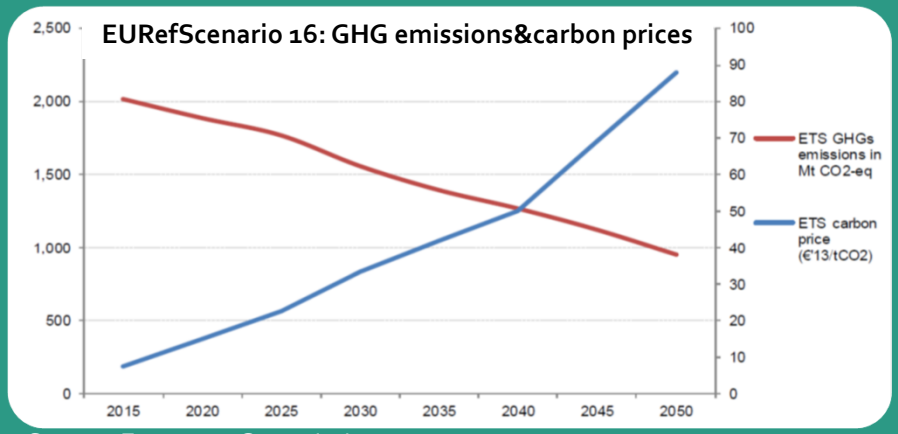
1. Costs of green technologies drop FM6
2. Carbon price (reinforcement of ETS) FM7

Policies

3. Environmental fiscal policy
4. Incentives
   - Tariffs, auctions
   - Barriers elimination
     - Simplified authorisation procedures
     - Clear market regulation



Source: SEN 2017



Source: European Commission

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FM6 Costs of Solar and Wind are expected to be less than Natural gas by 2021-22
Francesco Marghella; 29/10/2017

FM7 In the last reference scenario by the Commission, the carbon price would hit 30 €/tCO2 by 2030. In Italy Natural gas generation costs will be less than Coal costs with a carbon price of 25 €/tCO2
Francesco Marghella; 29/10/2017

Financial measures & Cultural leap to make the transition possible

Financing decarbonizing initiatives should be facilitated by

- Stable market rules
- Guarantees by public bodies on standard investments

A cultural leap is requested for

- Business and people awareness on climate-energy issues

Impacts on the economy

The activation of the Italian value chain represents the real crossroads that makes decarbonization a good deal

- Energy-economic modeling tells us that when…

  …Investments for energy transition stimulate the production of Italian industrial sectors, net benefits could reach 40 billion € in 2030 (I-O approach) MF1

  …Analysis accounts for international trade, the impact on the economy is slightly negative (CGE models) MF2

The reason is the worsening of the trade balance originated from competitive distortions caused by global different decarbonization policies

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MF1 Input-Output approach; Period of analysis 2012-30; Source: ENEA with SAM (Social Account Matrix)
Marghella Francesco; 31/10/2017

MF2 Computable General Equilibrium models; Period of analysis 2012-30; Source: ENEA with GDyn-E
Marghella Francesco; 31/10/2017

Driving towards decarbonization in an Italian car

- When local industry is involved in the process, the energy transition to 2030 could have a huge impact on the economy
  - Level of production → *GDP growth increase: 0,4-0,5%* MF3
  - Labour market → *Increase in number of people employed: 130.000-165.000* MF4

- Role of government
  - Devise energy policies that favor Italian industry within a European mechanism that does not restrict the exchange of goods
  - Be involved in international climate policy debate in order to fix competitive distortions

- Role of private management
  - Be ready to lead the transition using domestic knowledge and technologies
  - Multiply the research effort in in the promising green sectors that could also boost exports

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MF3 Input-Output approach; Source: Confindustria 2017
Marghella Francesco; 31/10/2017

MF4 Input-Output approach; Source: Confindustria 2017. Social Account Matrix (SAM) Source: ENEA
Marghella Francesco; 31/10/2017

No regret implications of decarbonization

Other benefits

- Dependency on energy imports reduction
  From 77% to ~ 65% in 2030 (EU average at 54% today)
- Energy net imports reduction
  ~ 80 billion € cumulated to 2030
- Carbon emission permits saving MF5
  ~ 2 billion € cumulated to 2030 vs. Reference scenario
  ~ 5 billion € cumulated to 2030 vs. No CO_2 reduction
- Other environmental benefits
  - To be quantified MF8 MF9

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MF5 Cost saving due to GHG emission cut in ETS sectors; Carbon price from 8 €/t CO2 today to 27 €/t CO2 in 2030
Marghella Francesco; 31/10/2017

MF8 Italy is still missing an official energy external cost analysis. Institutional models estimating pollutants emissions (i.e. Gains by ENEA) are not used to evaluate environmental damages and health costs for the draft of the energy strategy.
Marghella Francesco; 31/10/2017

MF9 However, international organizations recognize that energy systems decarbonization implies significant externalities reductions. The International Renewable Energy Agency (IRENA) estimates that local pollution and GHG emissions reduction could lead to a 4.2 thousand billion $ saving globally to 2030. This sum would be fifteen times the cost of RES share doubling in energy systems.
Marghella Francesco; 31/10/2017

Key messages

- Decarbonization of energy system is a great opportunity but a lack of involvement of domestic industry in the process can bring poor results
- Italy possesses technologies and capabilities to support the energy transition. They only need to be well governed
- Managers are ready to fight for a better environment while fostering economic and social growth

Thank you for your attention