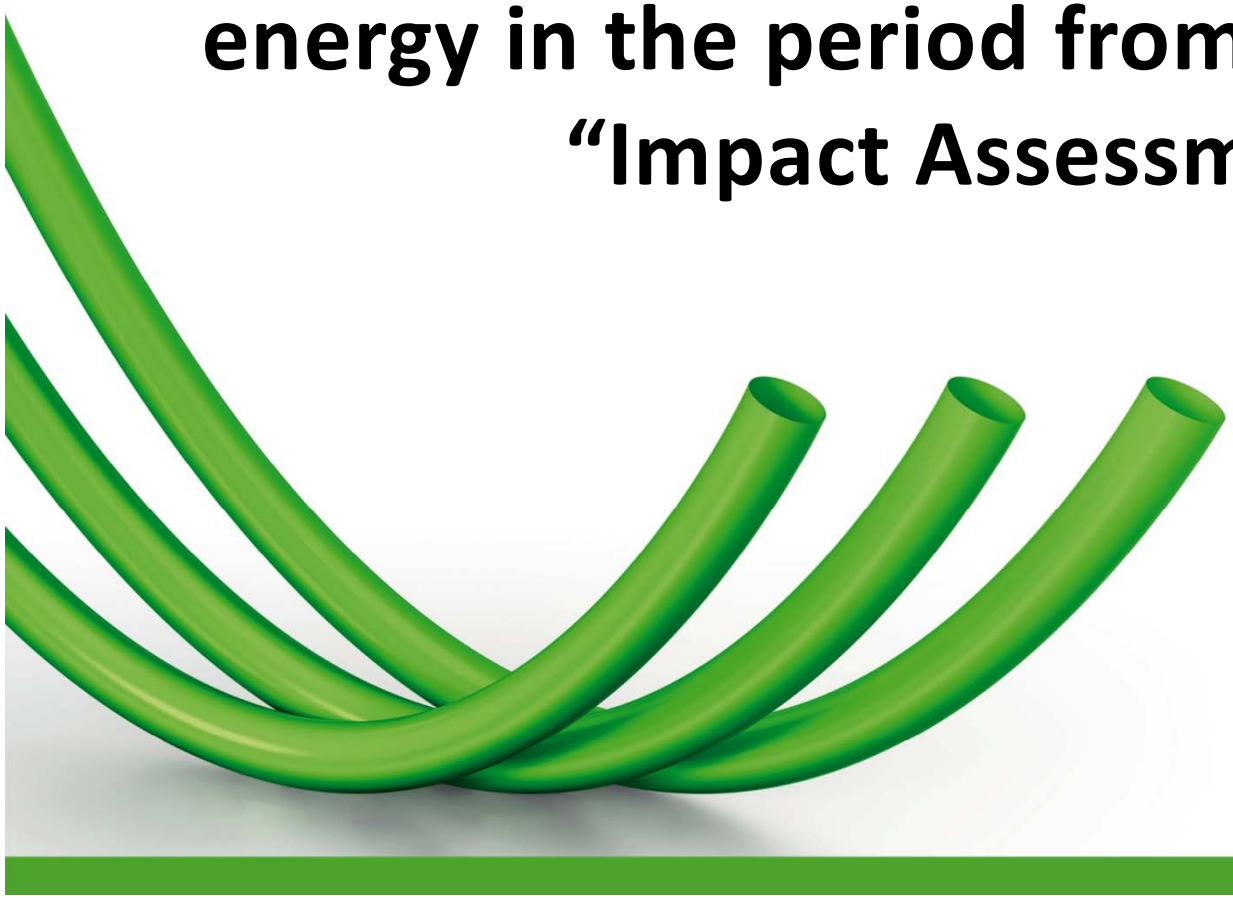
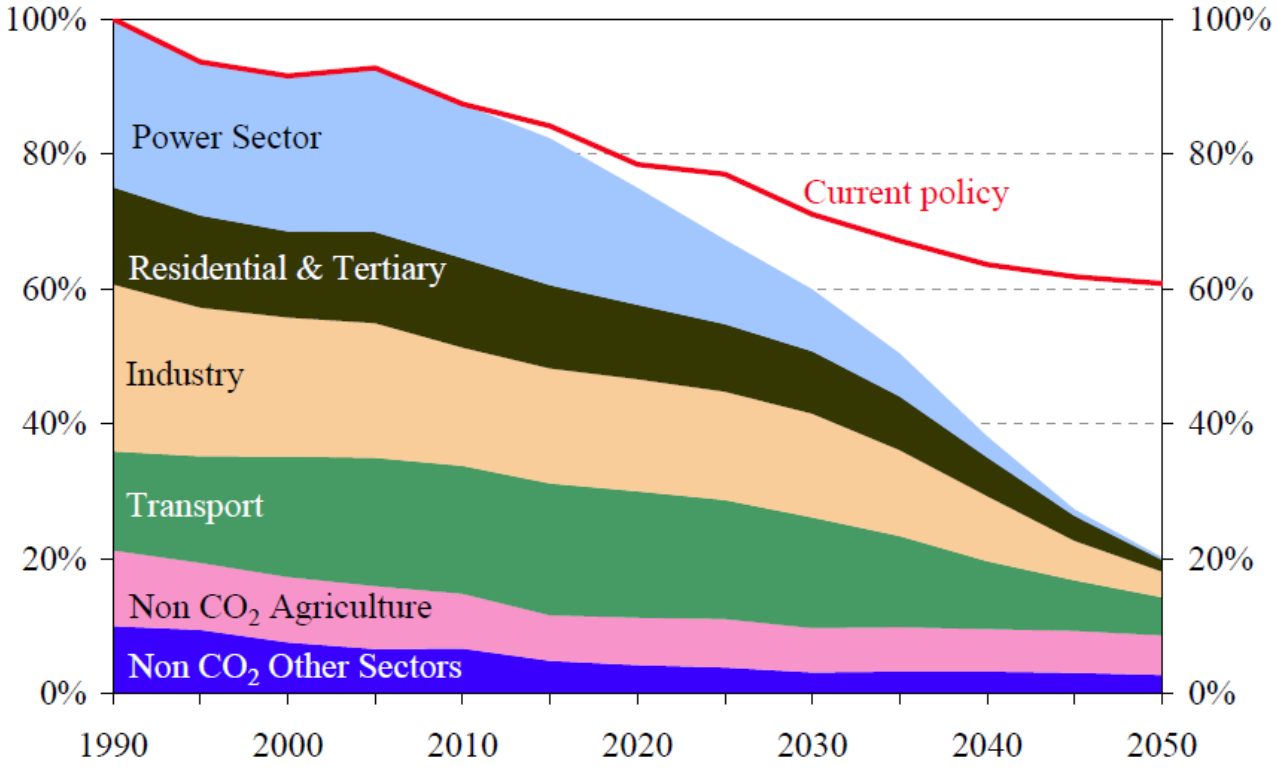
A policy framework for climate and energy in the period from 2020 to 2030 “Impact Assessment”



Nuova proposta obiettivi energetici europei al 2030

Roadmap for moving to a low-carbon economy in 2050

The Roadmap (8 Mar 2011) sets out a cost-efficient pathway to reach the target of reducing domestic emissions by **80% by 2050**. To get there, Europe's emissions should be **40%** below 1990 levels **by 2030** and 60% below by 2040. All sectors will have to contribute.



On 22 January 2014 the Commission proposed energy and climate objectives to be met by 2030.

What are the objectives?

- **40%** cut in greenhouse gas emissions (compared to 1990 levels).
- To achieve at least a **27%** share of renewable energy consumption
- Energy efficiency to play a vital role, but **no specific target** at this point.

Why more objectives?

The EU already has a comprehensive set of energy and climate policies for the period up to **2020**. But forecasts looking forward to **2050** suggest that current policies are not sufficient to bring about a sustainable, secure and competitive low-carbon economy and energy system.

Impact Assessment

The policy initiative underpinned by this Impact Assessment is only the first step to a comprehensive and detailed solution to energy and climate challenges in a 2030 perspective.

The operational objectives for a 2030 climate and energy policy framework are to:

- Propose coherent headline **target(s)** for climate and energy at the EU level to steer climate and energy policy in a 2030 perspective;
- Propose **key indicators** for the competitiveness of the energy system and security of energy supply, as appropriate associated with aspirational objectives, to keep track of progress over time and get a clear basis for policy response;
- Propose the **general direction** of the appropriate design of future concrete policies needed to meet 2030 objectives.

Scenario analisys

Policy Scenarios (1)

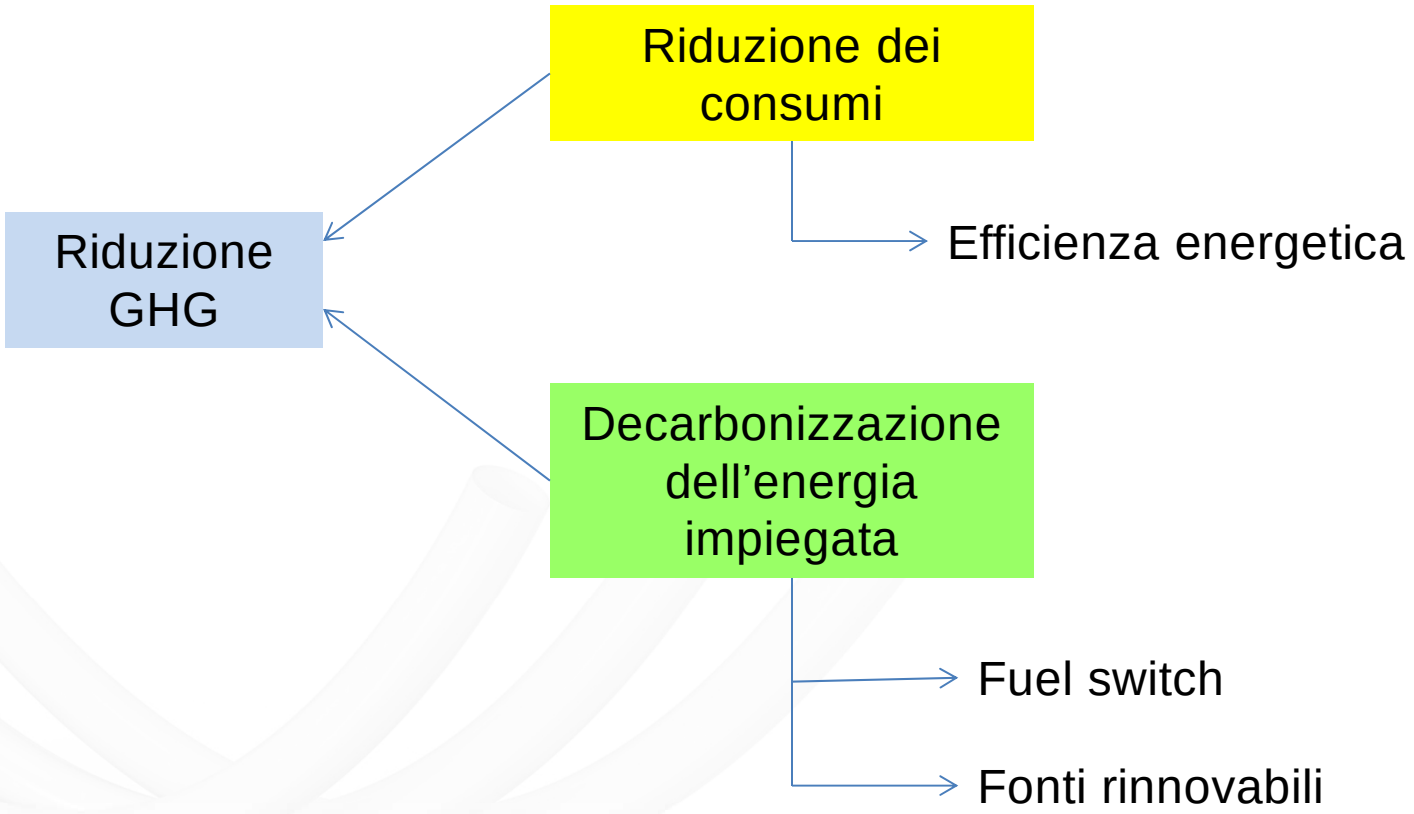
The main options for combining headline targets considered are:

1. **A sole GHG target**, including elements of supporting renewables and energy efficiency policies.
2. **A GHG target** combined with explicit **(additional to the reference scenario) energy efficiency measures** and elements of supporting renewables policies.
3. **A GHG target** combined with a **pre-set renewables target** and explicit **additional energy efficiency measures**.

For each of these, sub-options are considered where applicable:

A. GHG targets of between **35 and 45%** (reductions compared to 1990 GHG emissions levels).
B. Pre-set RES targets of **30 and 35%** (or no pre-set target) as a share of gross final energy consumption.
C. Different level of ambition (moderate, ambitious and very ambitious) for energy efficiency policies (additional to those already present in the Reference scenario).

Relazione tra i diversi obiettivi del pacchetto 20-30



Policy Scenarios (2)

In order to assess these options, a large number of scenarios combining targets and ambition levels have been analyzed, out of which 7 have been retained for more detailed assessment, shown in the Table below.

Scenario	*GHG 2030 vs 1990*	*RES 2030 (% final En. Cons.)*	*EE 2030 (change vs 2030 proj.[4])*
Reference Scenario	*-32.4%*	*24.4%*	*-21.0%*
Reference scenario conditions			
GHG35/EE®	-35%	No pre-set target (25.5%)	No pre-set target (-24.4%)
GHG37®	-37%	No pre-set target (24.7%)	No pre-set target (-22.9%)
GHG40®	-40%	No pre-set target (25.5%)	No pre-set target (-24.4%)
Enabling conditions			
GHG40	-40%	No pre-set target (26.5%)	No pre-set target (-25.1%)
GHG40/EE	-40%	No pre-set target (26.4%)	No pre-set target (-29.3%)
GHG40/ EE/RES30	-40%	30%	No pre-set target (-30.1%)
GHG45/EE/RES35	-45%	35%	No pre-set target (-33.7%)

Policy Scenarios (3)

The assessed scenarios are characterized according to whether they are based on **reference conditions ®** (i.e. the same conditions as in the Reference scenario) or on the **enabling conditions**, which the analysis supporting the **2050 Energy and Low Carbon Economy Roadmaps** demonstrated as essential for the long term transformation.

Enabling cost-effective decarbonisation of power generation:

- Intelligent grids and metering
- Infrastructure to harvest decentralised as well as remote RES for power generation
- Carbon transportation and storage infrastructure and acceptance (CCS)
- Hydrogen-based storage

Enabling decarbonisation and electrification of transport:

- Electric vehicles battery technology development
- Development of recharging infrastructure
- Innovation in biofuels

Enabling reduction of energy demand:

- Overcoming market barriers to Energy Efficiency in buildings
- Energy Efficiency innovation diffusion in the industry and in the domestic sectors

Main results (2030) - Environmental impacts

All scenarios demonstrate reduced GHG emissions compared to the Reference scenario. With respect to 1990 levels, the reduction levels are inherent in the scenario definition and for this reason lower in GHG35/EE® and GHG37® and higher in GHG45/EE/RES35.

Scenarios differ however with regard to the balance of GHG reductions in the various sectors of the economy: scenarios with ambitious energy efficiency policies typically reducing GHG emissions more in the sectors outside of the ETS. In most scenarios, the power sector reduces emissions most compared to 2005 levels and the transport and agriculture sector reducing least.

In scenarios with strong energy efficiency policies but without an explicit renewables target, reductions in the residential sector are substantial at levels similar of that of the power sector.

Main results (2030) - Energy impacts

All scenarios show reduced energy consumption (both primary and final) compared to the Reference scenario.

The savings are the highest for scenarios with ambitious EE policies and RES targets.

Consequently, the energy intensity of the EU economy is reduced.

Net imports decrease significantly for all scenarios and in more pronounced manner under the scenarios with ambitious EE policies. The positive impacts of scenarios are well visible in the fossil fuels import bill savings.

Finally all scenarios have impact on development of CHP and CCS, which visibly increase their penetration, with the scenario focussing on GHG only having the highest shares of CCS.

Main results (2030) - Economic impacts

System costs increase in all policy scenarios by 2030.

The components of system costs change in the policy scenarios compared to the Reference scenario, with more pronounced capital costs and lower operational costs due to fuel savings.

GDP impacts for policy scenarios can be either negative or positive. This depends to a large extent on the future approach to auctioning and CO_2 taxation in the non-ETS sectors and the use of the related revenue. Furthermore, for the scenarios evaluated in this regard, impacts on GDP are generally speaking projected to be positive in scenarios with explicit energy efficiency polices.

Energy Purchases are significantly reduced in all scenarios, most notably in scenarios with explicit EE policies and RES targets. But investment costs increase, again more notably in scenarios with explicit EE policies and RES targets. Importantly, these investments have great potential for driving jobs and growth in the EU.

Main results (2030) – Macroeconomic impacts

Reduced primary energy consumption, and consequent reduced fuel costs, would positively impact the EU's trade balance, keeping funds in the EU economy.

Higher investment expenditures have greater potential for driving jobs and growth in the EU than fuel imports, in particular due to the local nature of energy efficiency investments and of renewables installation and to the industrial and technological leadership the EU companies still have in terms of energy efficient and low-carbon technologies.

Compared to the Reference scenario, in 2030 the scenario led by a 40% GHG reduction would create around 0.7 million additional jobs (645,000) and the scenario based on 40% GHG reduction, ambitious explicit EE policies and a 30% RES target would create 1.25 million additional jobs.

The largest increases in employment result from changes in Energy Efficiency requirements in the residential and tertiary sector. Employment generated by these investments is 49% and 67% higher than in the Reference scenario.

Main results (2030) - Summary

	Reference	GHG35/EE®	GHG37 ®	GHG40 ®	GHG40	GHG40/EE	GHG40/EE/RES30	GHG45/EE/RES35
Conditions	Ref.	Ref.	Ref.	Ref.	Enabling	Enabling	Enabling	Enabling
GHG reduction vs 1990	-32.4%	-35.4%	-37.0%	-40.4%	-40.6%	-40.3%	-40.7%	-45.1%
RES Share	24.4%	25.5%	24.7%	25.5%	26.5%	26.4%	30.3%	35.4%
- heating & cooling	23.8%	24.6%	24.4%	25.5%	25.9%	25.8%	30.6%	35.2%
- Electricity	42.7%	45.4%	43.1%	44.6%	47.3%	46.1%	53.1%	65.7%
- Transport	12.0%	12.9%	12.0%	12.0%	12.8%	14.0%	14.6%	15.6%
Energy saving	-21.0%	-24.4%	-22.9%	-24.4%	-25.1%	-29.3%	-30.1%	-33.7%
Average price of electricity [€/MWh]	176	174	176	181	179	174	178	196
Energy Intensity (2010=100)	67	64	66	65	64	60	60	57
Energy Import (2010=100)	96	90	94	92	89	83	81	78

Il contributo dell'Italia ai nuovi obiettivi europei

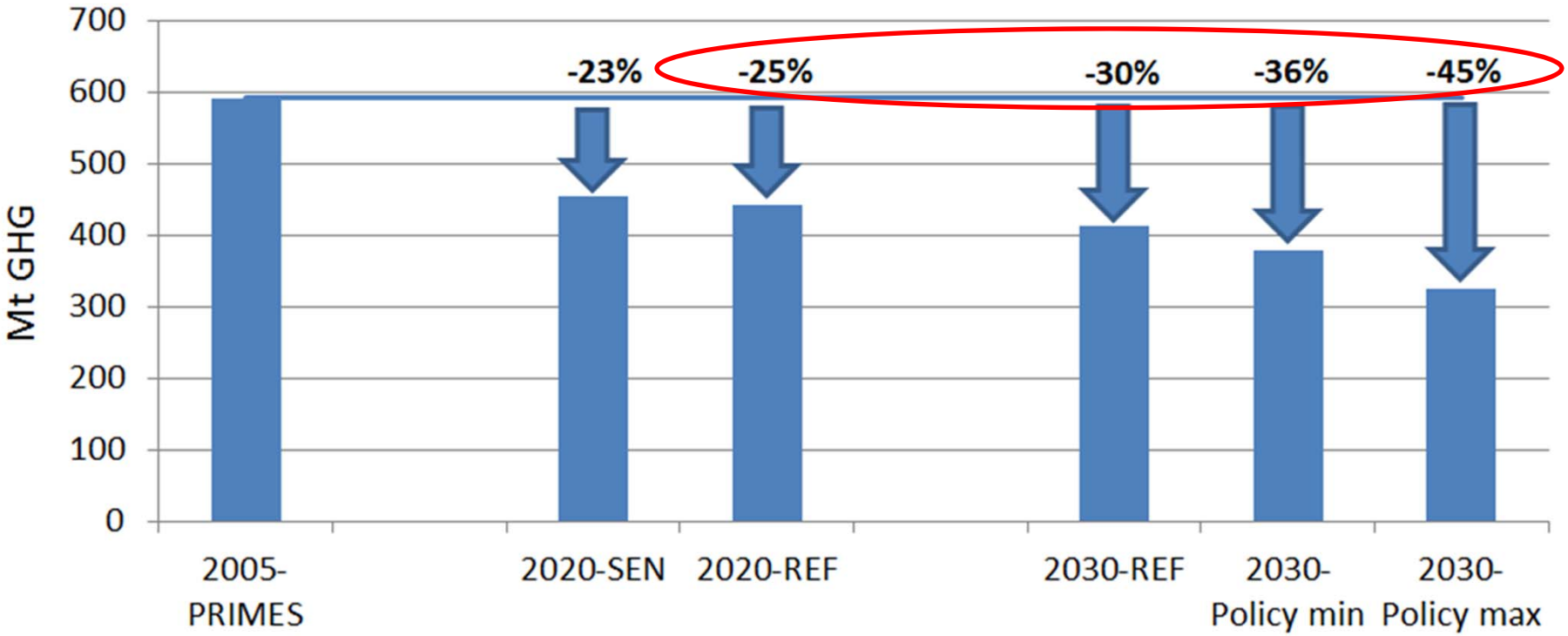
Risultati attesi
EU28 vs Italia

Scenario PRIMES 2013 Reference

	GHG 2030 rispetto a 1990 (riduzione %)	RES 2030 (% Consumo Finale Lordo)
EU 20	-32,4%	24,4%
Italia	-21%	20%

Riduzione emissioni rispetto al dato 2005 di PRIMES 2013 (592 Mt GHG)

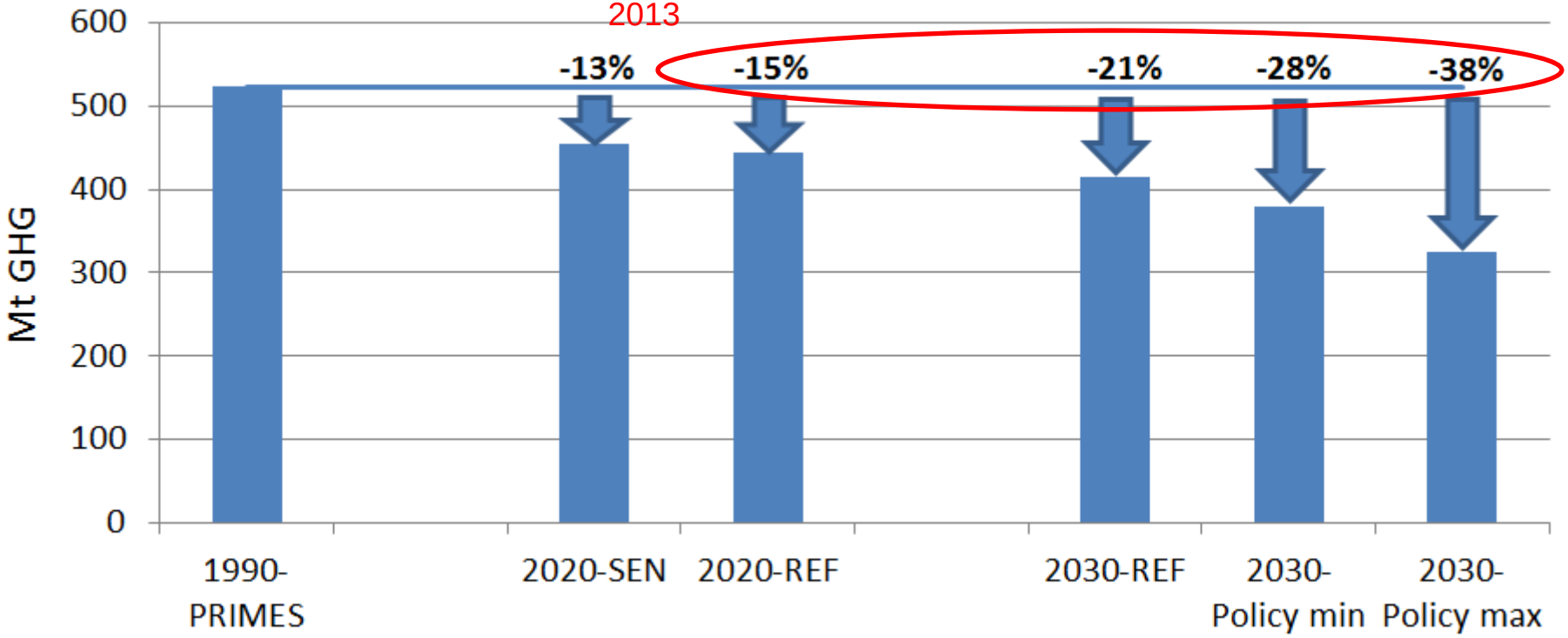
Percentuali di riduzione riportati nel documento di Impact Assessment



Nota: Il National Inventory Report ISPRA (NIR 2013) emissioni indica 574.33 Mt CO2 eq per il 2005 e il precedente PRIMES riportava 575 Mt CO2 eq

Riduzione emissioni rispetto al dato 1990 di PRIMES 2013 (524 Mt GHG)

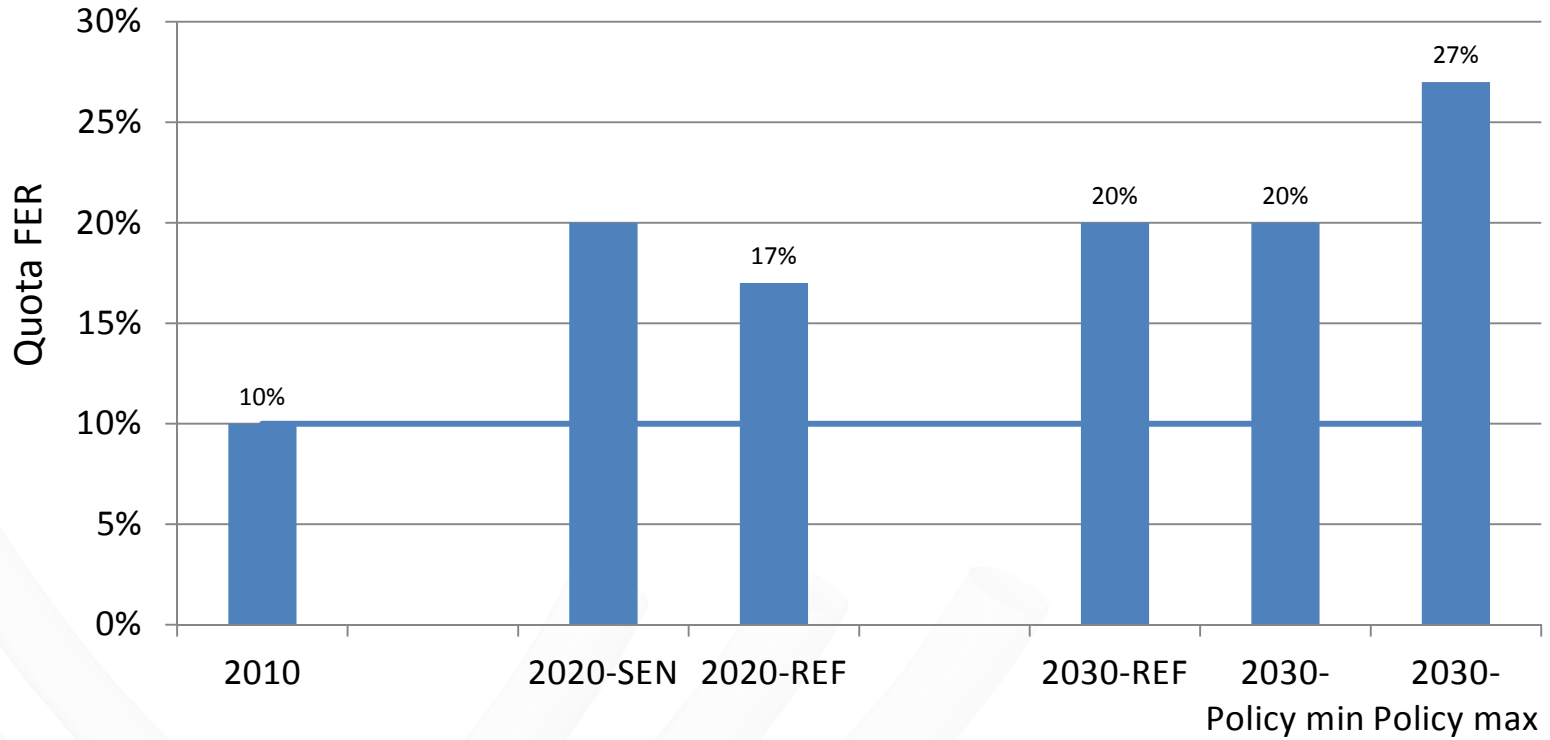
Percentuali calcolate dai valori dei GHG al 1990 riportati in PRIMES 2013 e dai valori dei GHG riportati negli scenari PRIMES 2013



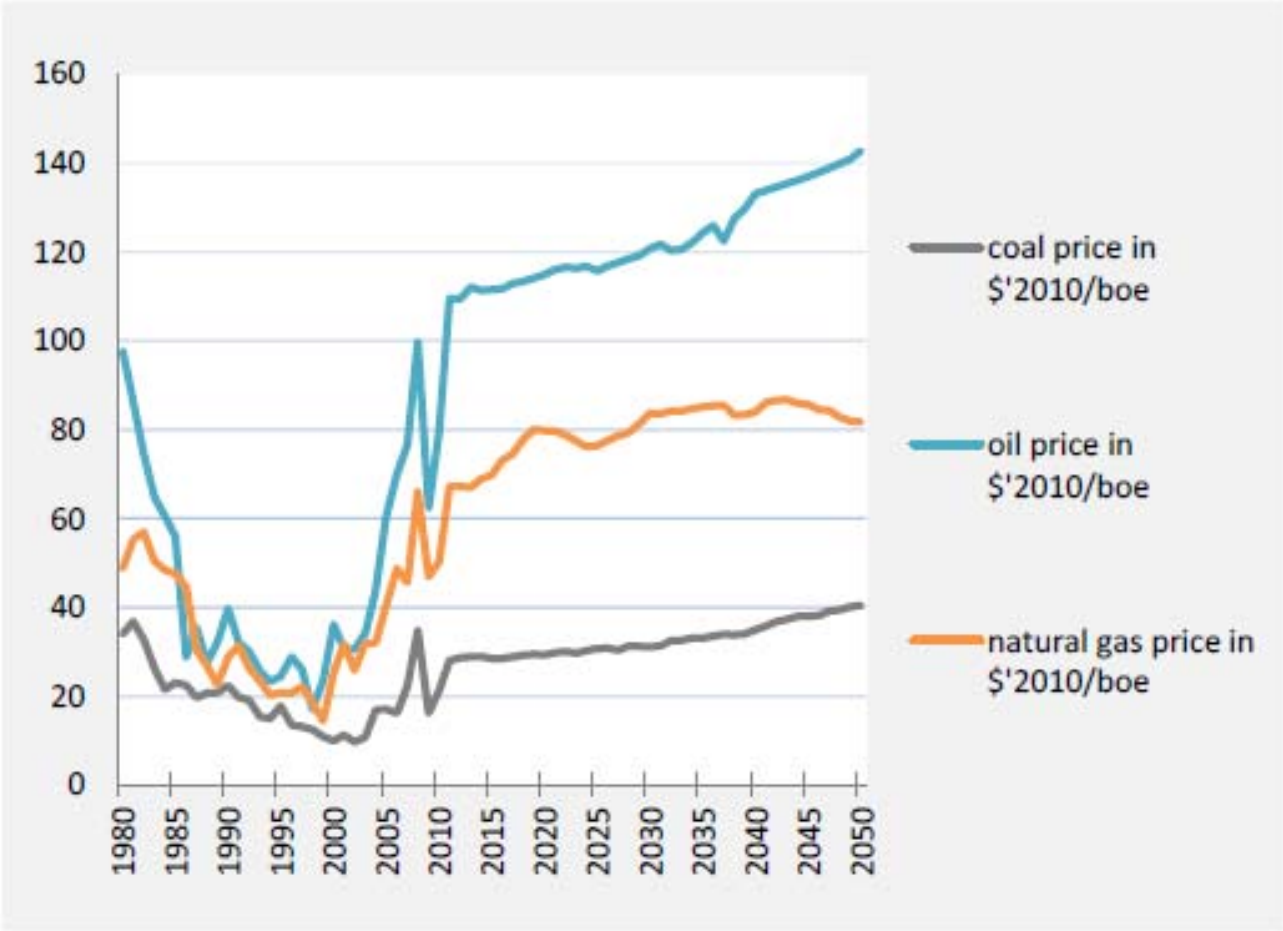
Nota: Il National Inventory Report ISPRA (NIR 2013) emissioni indica 519 Mt per il 1990.

Il 2010 PRIMES è allineato al 2010 del NIR.

Quota FER su consumo finale lordo di energia

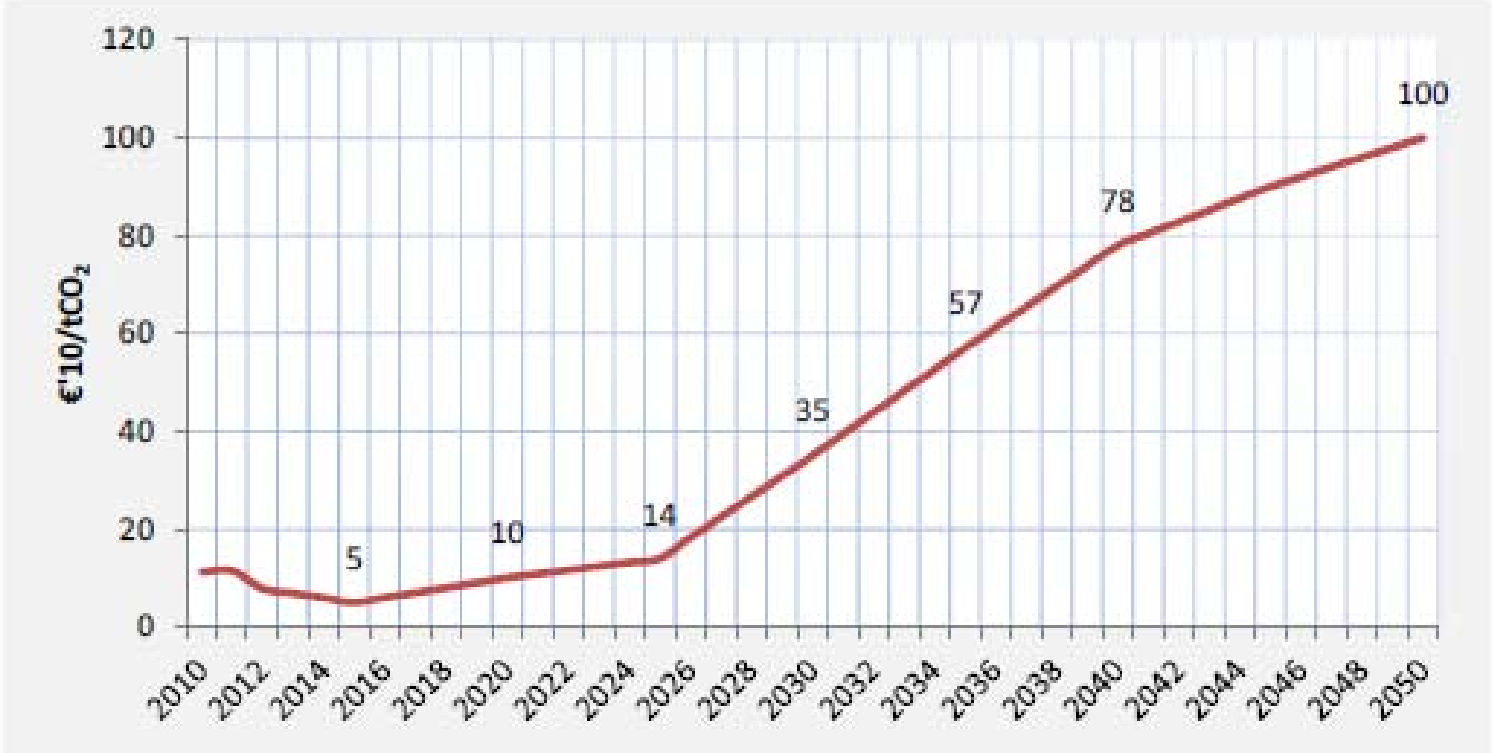


Scenario PRIMES 2013 Reference
Prezzi dei combustibili



Scenario PRIMES 2013 Reference

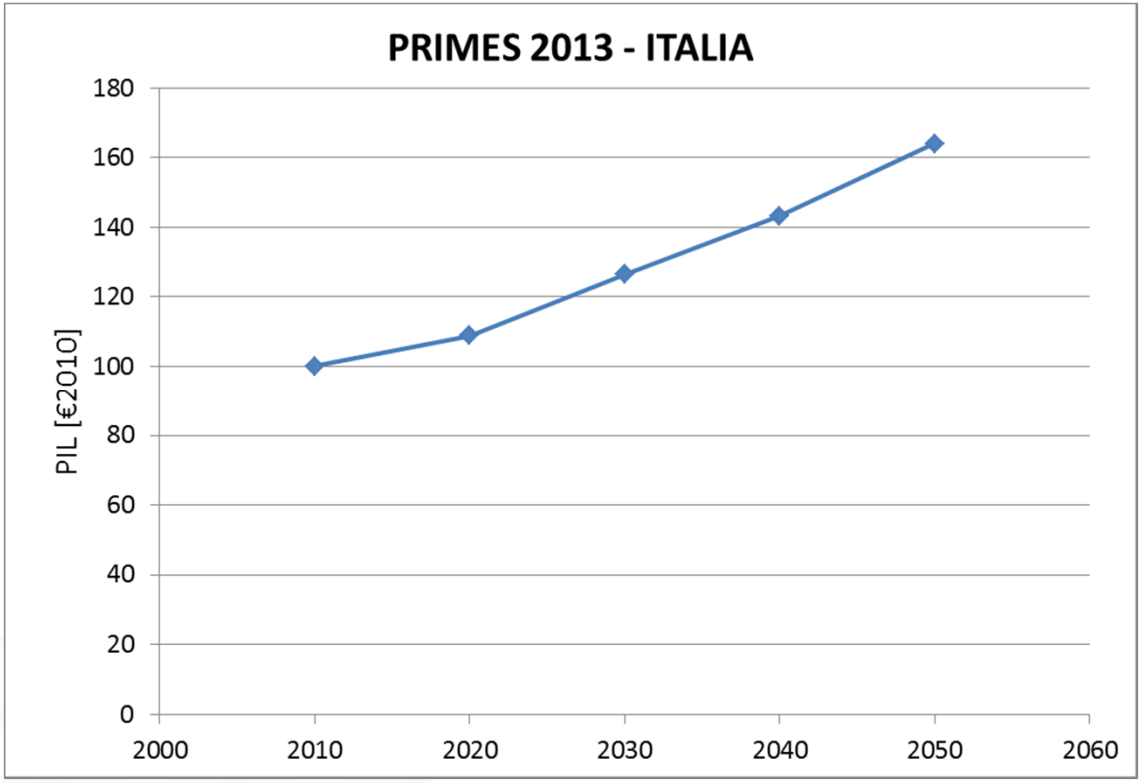
Proiezione prezzi ETS



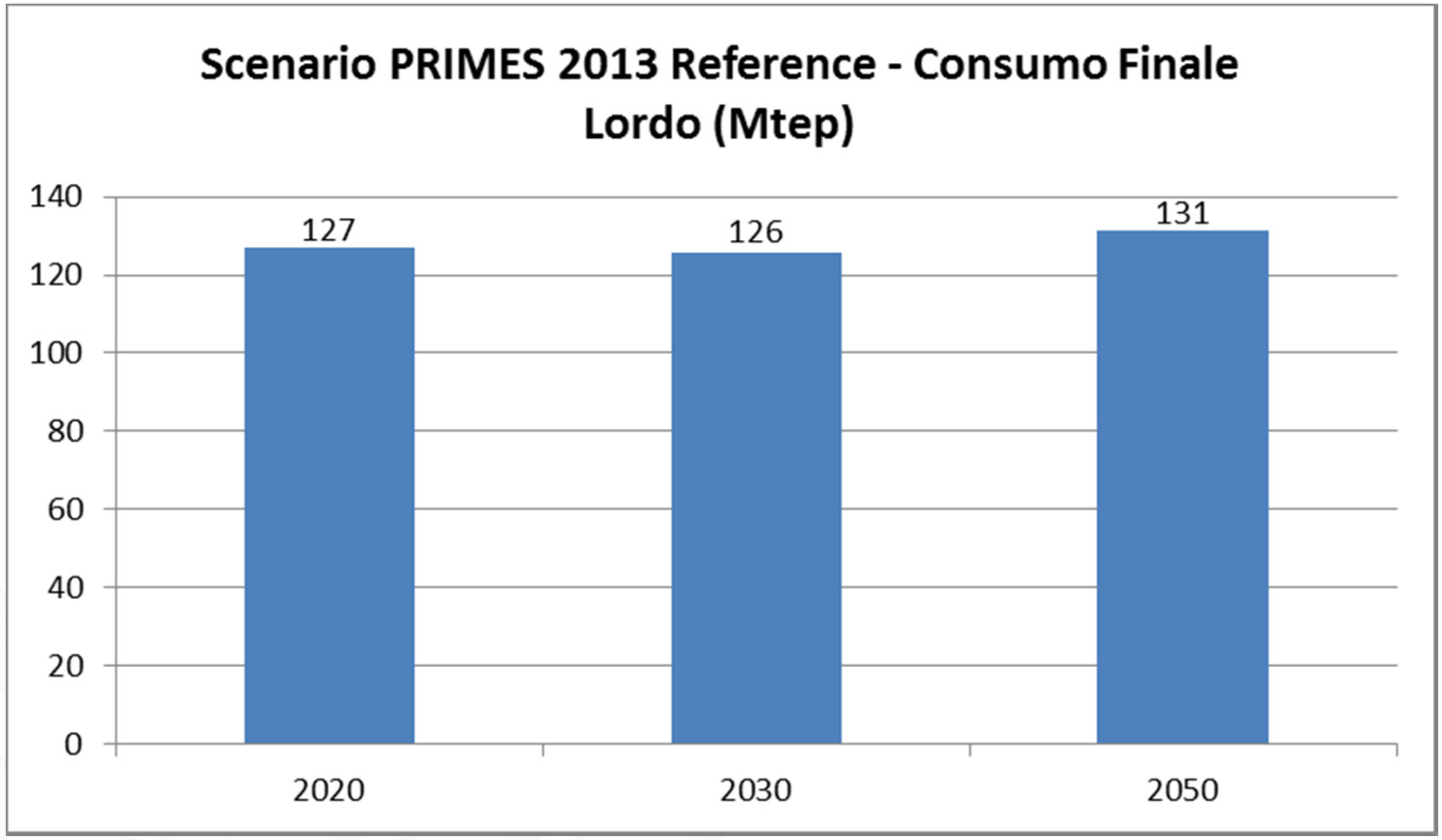
Scenario PRIMES 2013 Reference - Italia

Indicatori socio-economici: PIL

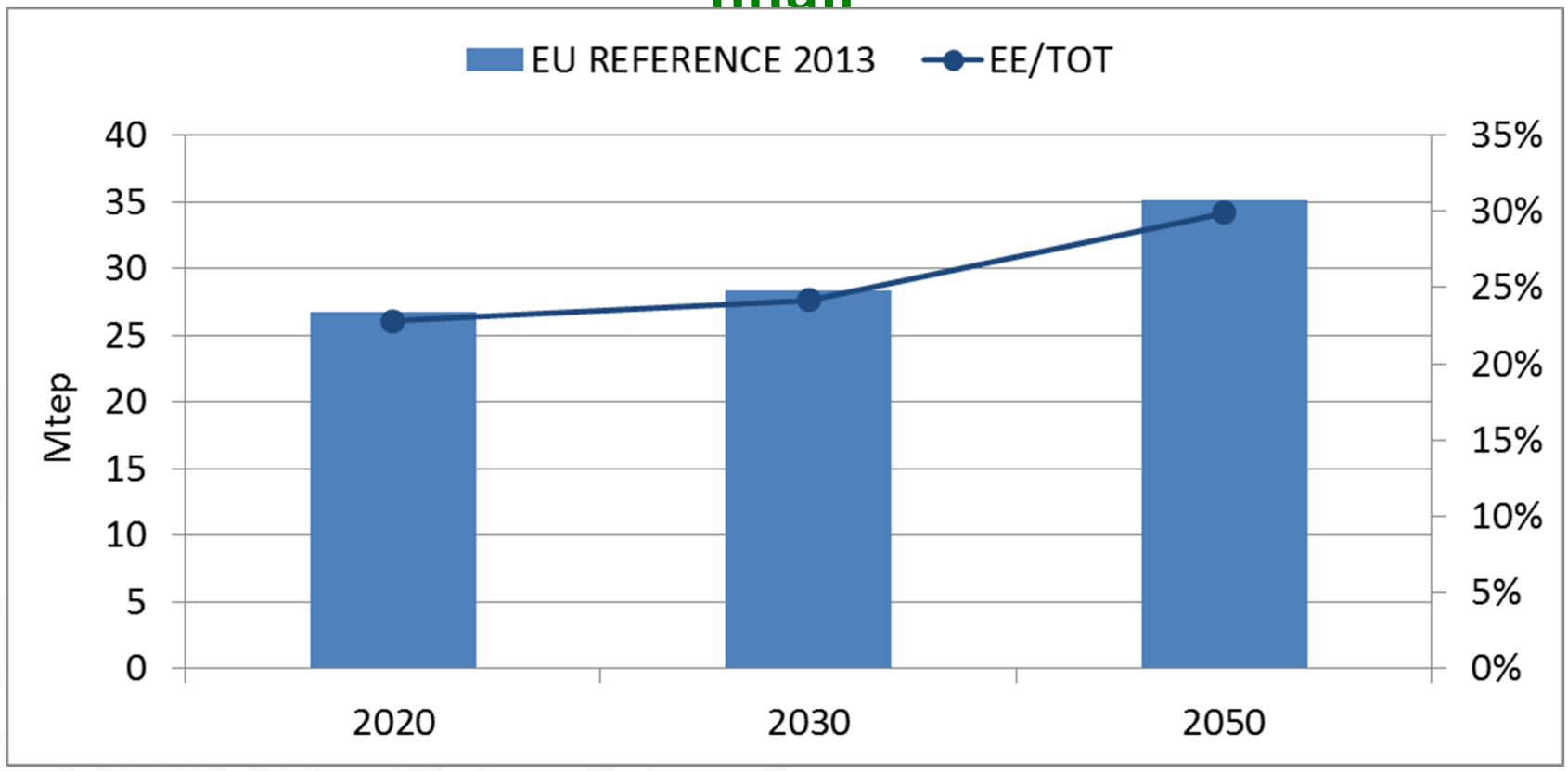
	2010-2020	2020-2030	2030-2040	2040-2050
EU REFERENCE 2013	0,9%	1,5%	1,3%	1,4%



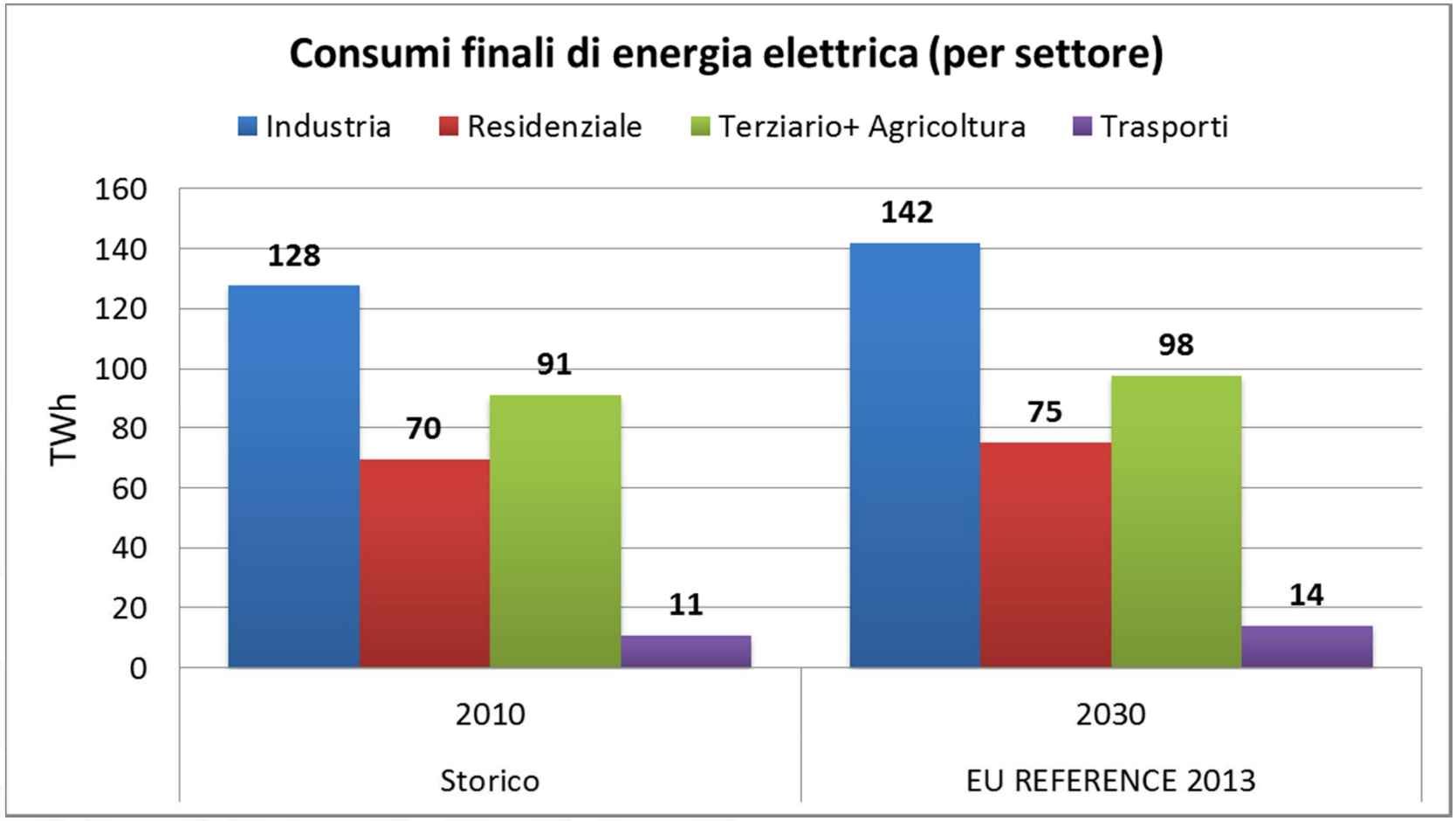
Scenario PRIMES 2013 Reference - Italia
Andamento domanda finale di energia



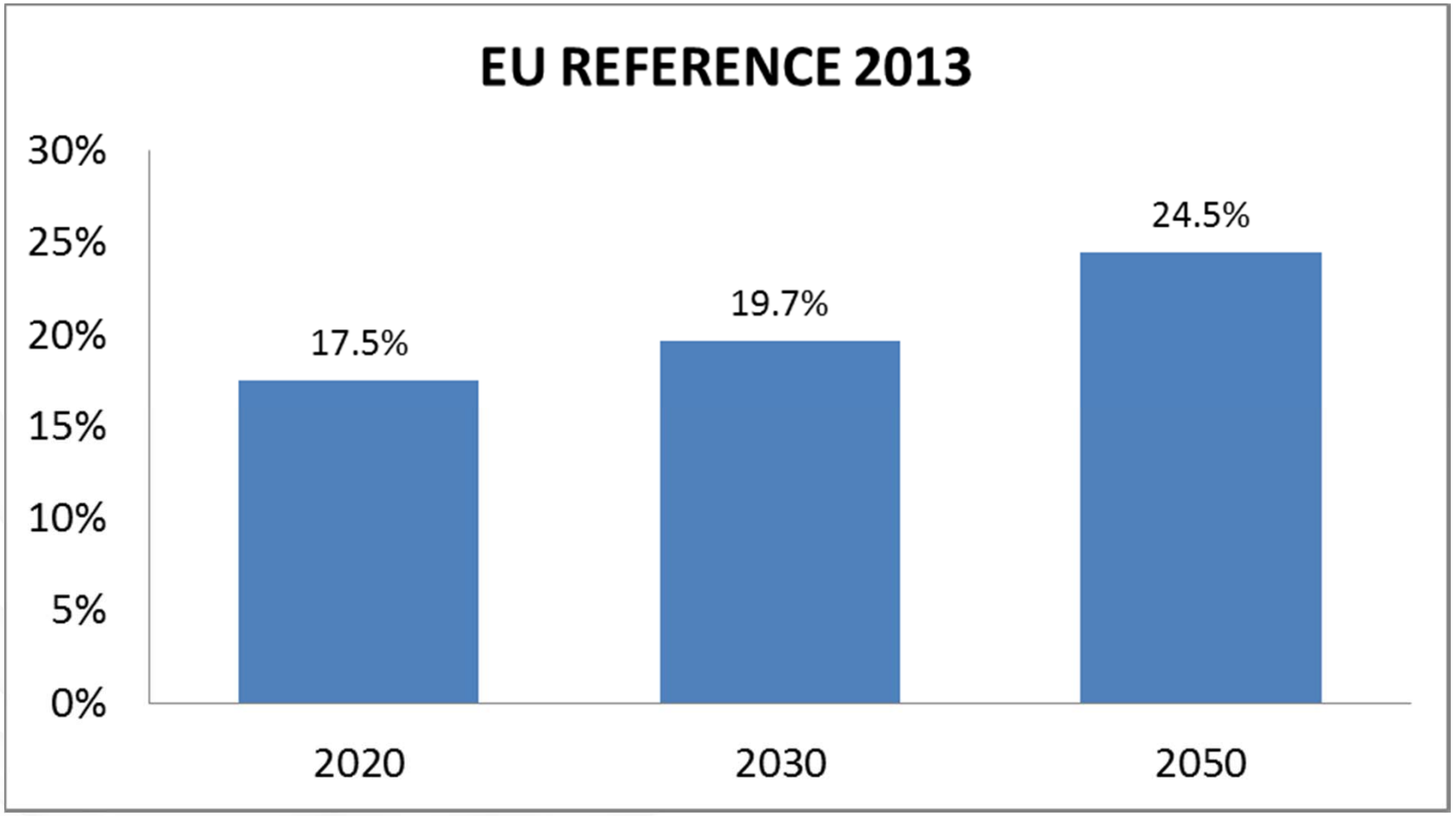
Scenario PRIMES 2013 Reference - Italia
Andamento della domanda elettrica in % su consumi finali



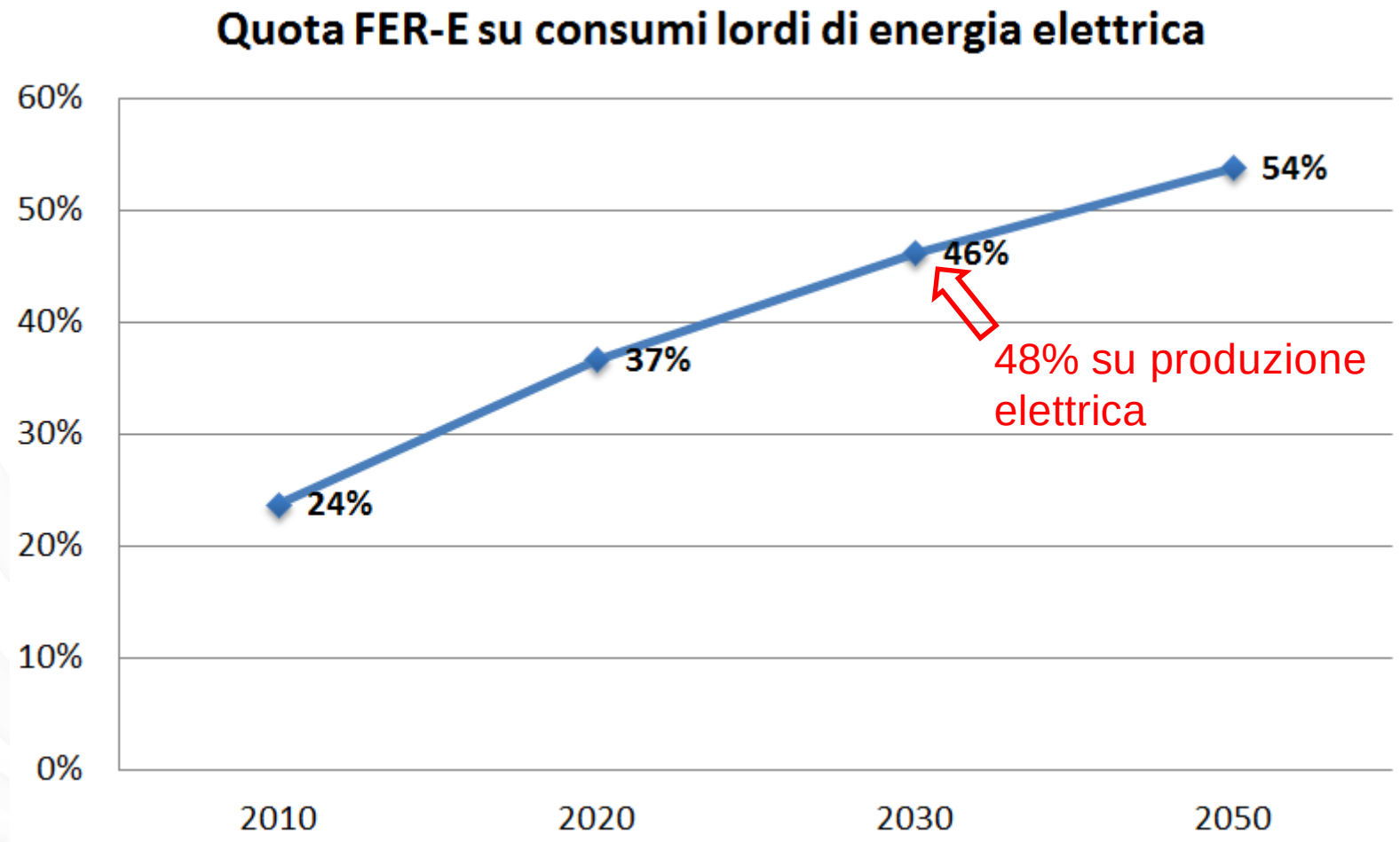
Scenario PRIMES 2013 Reference - Italia



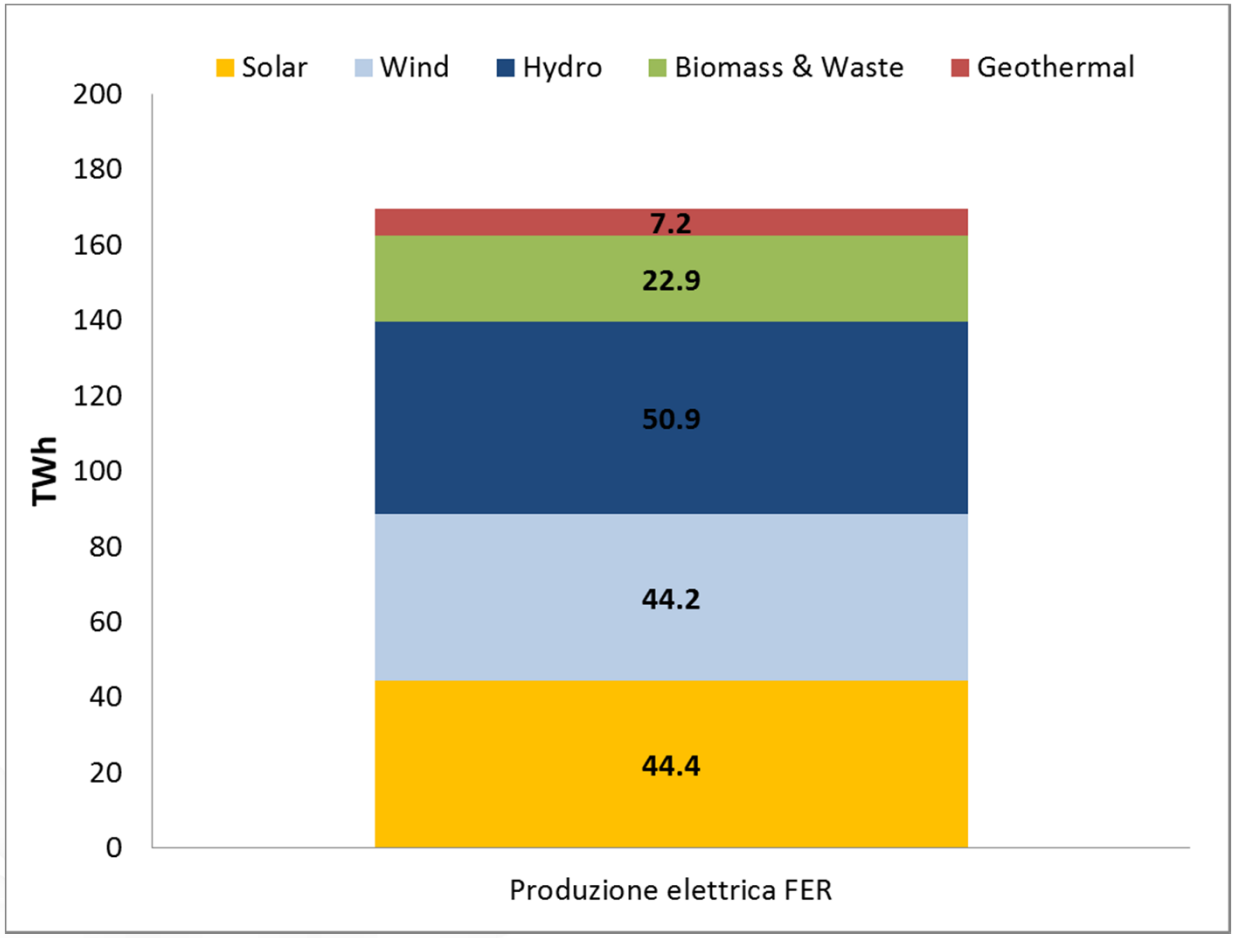
Scenario PRIMES 2013 Reference – Italia
Quota FER su consumi finali lordi



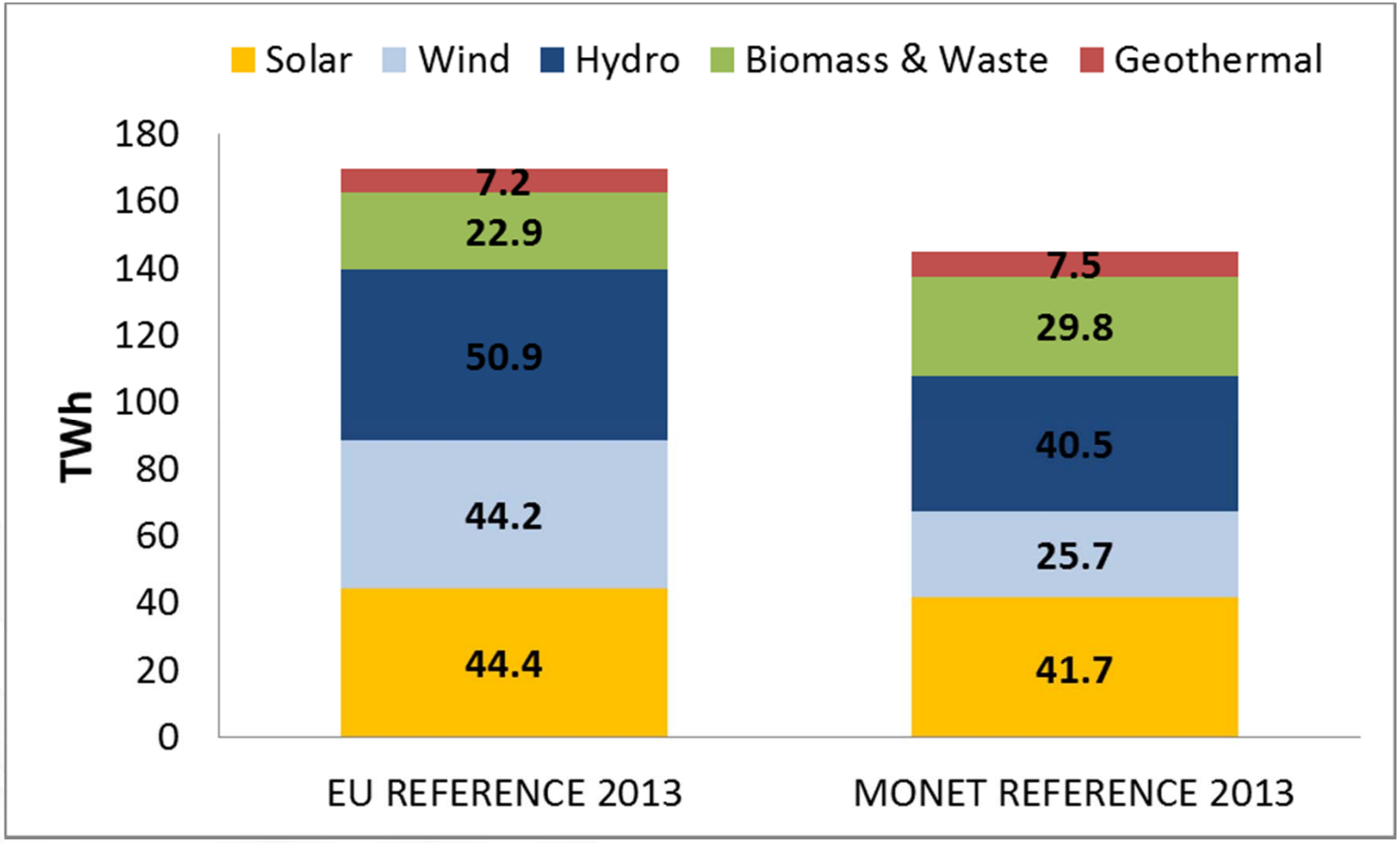
Scenario PRIMES 2013 Reference - Italia



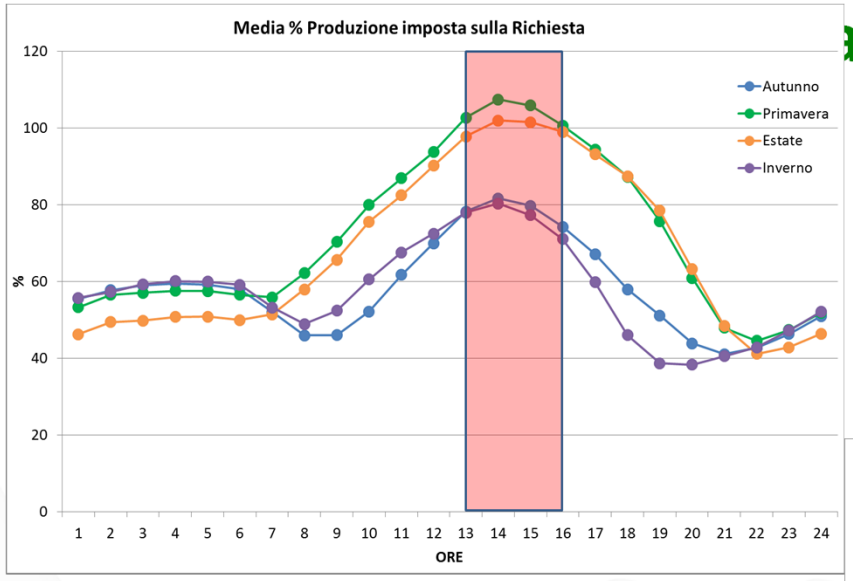
Scenario PRIMES 2013 Reference - Italia
Dettaglio produzione FER elettriche (anno 2030)



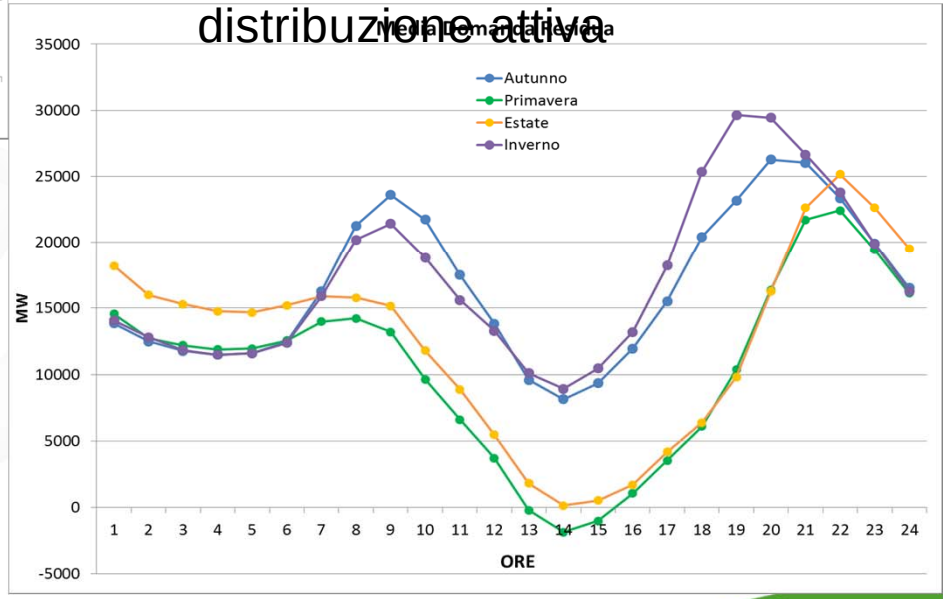
Scenario PRIMES 2013 Reference - Italia
Dettaglio produzione FER-E (per fonte) - anno 2030



Impatto sul sistema elettrico di uno scenario con altissima penetrazione di FER-E (58% della [illegible]anda)



- Criticità per il rispetto di vincoli tecnici (riserva, rampa di carico accensioni/spegnimenti)
- Potenziamento della rete di trasmissione
- Accumuli ed rete di distribuzione attiva



Scenario 20-30: le criticità tecniche e di accettabilità sociale

Gli ulteriori interventi di sviluppo FER e di efficienza energetica richiedono sforzi di integrazione e di sviluppo infrastrutturale, con un impatto sui costi da valutare

- Sviluppo rete e elettrica e accumuli
- Sviluppo reti di TLR
- Infrastruttura per mobilità elettrica
- Ristrutturazione patrimonio edilizio

Problemi di accettabilità sociale e di integrazione con il territorio per alcune importati tecnologie di decarbonizzazione:

- Biomasse (in particolare combustione biomasse solide)
- CCS
- Eolico on-shore/off-shore

Grazie per l'attenzione!