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Bridging the industrial energy efficiency gap: Assessing the evidence from the Italian white certificate scheme

Jan Stede Berlin, 13.09.16

Core features of the Italian white certificate scheme (1)

- Motivation for Italian WhC scheme: high industrial electricity prices, elevated energy dependency rate
- Obligation to introduce energy efficiency obligations (or adopt alternative measures) in Art. 7 of EU Energy Efficiency Directive
- Ambitious targets: The 2020 goal (9.7 Mtoe) is equivalent to 6.4% of Italy's 2015 primary energy consumption
- Distribution companies obligated (13 electricity and 48 natural gas distributors)
- But vast majority (~75%) of savings delivered by the energy services sector* (wide range of eligible voluntary parties)

*An energy service is an operation to measurably improve energy efficiency, delivered on the basis of a contract \rightarrow external companies delivering energy efficiency measures



Core features of the Italian white certificate scheme (2)

- Certificates for energy savings are awarded for **five years** (but longer lifetime taken into account)
- Measurement & Verification: There are four methods of saving (both deemed savings approach and metering approach)
- Additionality: Only white certificates for energy savings that go beyond a market and regulatory baseline (determined for each project)
- Certificates can be traded on an official spot market and bilaterally (OTC)

Evidence from survey among key stakeholders: White certificates are the major policy instrument to promote industrial energy efficiency

Average score



The scores are computed by assigning each policy ranked 1, 2 and 3 by the respondents ("Please name the three most important policy instruments") a corresponding score of 3, 2 and 1. For each policy instrument, the score is then averaged over all respondents.

Source: Stede (2016): Bridging the Industrial Energy Efficiency Gap: Assessing the Evidence from the Italian White Certificate Scheme. DIW Discussion Papers 1565.





Share of annual white certificate issuance by sector

2



Source: Stede (2016)

The *tau* coefficient is the main driver behind the shift to the industrial sector

Energy savings



Source: Own illustration based on Di Santo et al. (2014)

- → Technology-specific multiplier for the monetary value of white certificates for a project, introduced in 2012
- → In many cases monetary incentive more than triples as WhC spot market price has remained stable ~100 Euros





White certificates now cover around one quarter of investment costs in the industrial sector ...

- The *tau* coefficient significantly improves the monetary value of white certificates by taking into account the entire technical lifetime of an energy efficiency measure
- Payback time reduced from 3.12 to 2.37 years (nine months) when the monetary of white certificates is considered → certificates cover roughly 25 per cent of investment costs

 \rightarrow Significant monetary incentive for energy efficiency in the industrial sector



... But the *tau* coefficient has led to decreased real energy savings

Development of the white certificate energy savings goal and compliance with the annual targets Millions of toe



Source: Own illustration based on own calculations using data from GSE (2016), ENEA (2011), DM 28/12/12, AEEG (2007, 2008, 2009a, 2011a, 2012c) and GME (2011, 2012a, 2012b, 2013a, 2013b, 2014a, 2014b, 2015a, 2015b, 2016)

2



Strong development of the energy services sector

- The white certificates system has grown the number of certified Italian ESCOs from only a handful of companies to more than 140 in 2016
- Energy services sector has delivered ~75% of all savings



*ESCOs: (certified) Energy Service Companies

ESPCs: (non-certified) energy service provider companies

Source: Stede (2016)



2

Regulatory uncertainty is the main investment barrier in the context of the Italian WhC system



Average score

One example of regulatory uncertainty is the absence of updated "guidelines" (*linee guida*), that have been promised for years

Source: Stede (2016)





- White certificates can deliver energy efficiency at scale
- \rightarrow 3.2 Mtoe or 2% of Italy's primary energy consumption in 2012
- White certificates can kick-start the dynamic development of an active energy services sector
- \rightarrow Now >100 Italian ESCOs
- White certificates can deliver a wide range of energy efficiency interventions in different sectors

→ Different methods of saving are suitable for different projects (deemed savings vs. metering approach) – projects in Italy now mainly in industry

• A meaningful financial incentive from white certificates is key to the success

 \rightarrow Certificates now cover 25% of investment costs in the industrial sector, but the *tau* coefficient has led to decreasing real energy savings

- Information and management of the scheme also plays an important role
- \rightarrow General awareness as well as efficient governance processes are important
- Regulatory changes are necessary, but policy certainty is essential
- \rightarrow Regulatory uncertainty is the main investment barrier in Italy

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Thank you very much for your attention.



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BACKUP



- Five key elements (Bertoldi et al 2010):
 - Establishing an energy-saving obligation on some category of market actors (distribution companies or suppliers) – but savings can be delivered by third parties
 - An institutional infrastructure and processes (such as measurement and verification (M&V) of savings, additionality, uplift factors)
 - 3. A trading mechanism and the certification of savings
 - 4. A cost recovery mechanism
 - 5. An **enforcement mechanism** imposing sanctions in the case of non-compliance
- \rightarrow WhC systems in different countries vary substantially.



Electricity prices of the European medium-sized industry



Source: Own illustration using data from Eurostat



Market actors in the Italian WhC scheme



Source: Own illustration based on ENEA (2014)



The three main methods of saving of obtaining white certificates



Source: Own illustration





Source: Own illustration based on Di Santo (2014)

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Average score

Source: Own illustration







Source: Own illustration based on own calculations using data from AEEG (2012b, 2012c), GME (2013b) and GSE (2014a, 2015)



Millions of white certificates



Source: Own illustration based on data from GSE (2016)



The Italian WhC spot market price





Source: Own illustration based on own calculations using data from GME



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