ERSE
ENTIDADE REGULADORA
DOS SERVIÇOS ENERGÉTICOS

Energy Efficiency Levers

Portuguese energy efficiency regulatory plan (PPEC)

Isabel Apolinário

September 19, 2019

1. Crucial role for energy efficiency

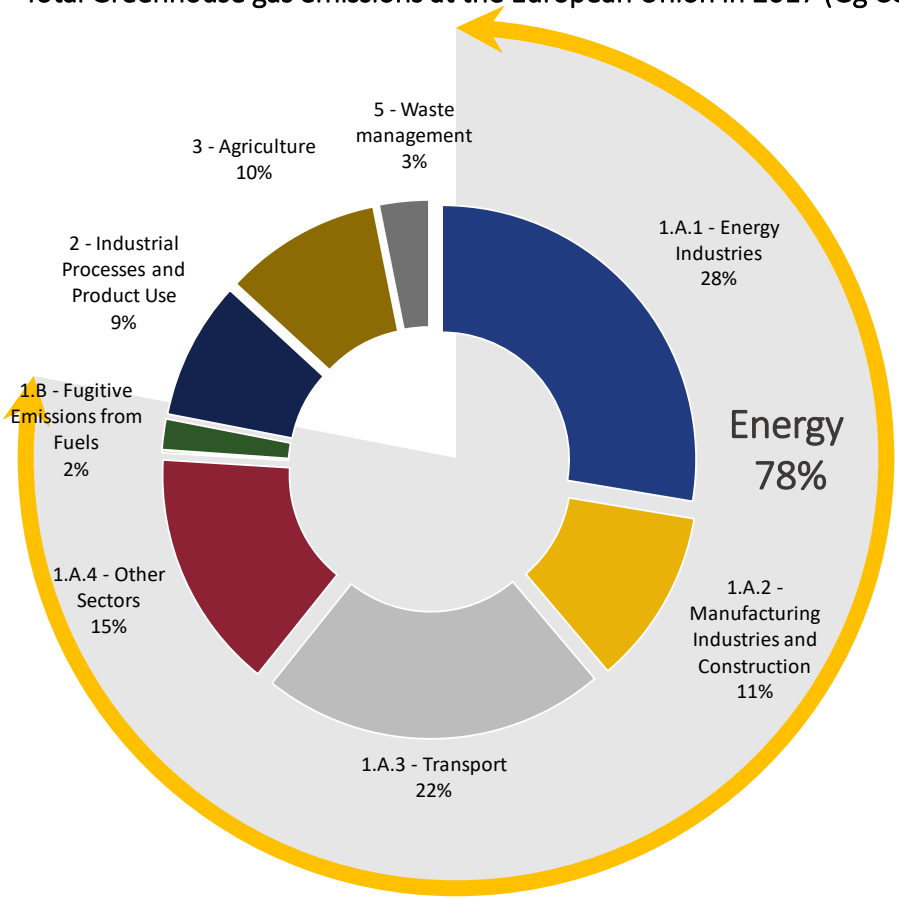
2. PPEC (Portuguese energy efficiency regulatory plan)

3. Final remarks

1. Crucial role for energy efficiency

Climate change…Carbon neutrality…Energy transition

Total Greenhouse gas emissions at the European Union in 2017 (Gg CO_2 eq.)



IEA, *the transition to low-carbon development paths and low-carbon energy systems is now widely seen as the "new normal".*

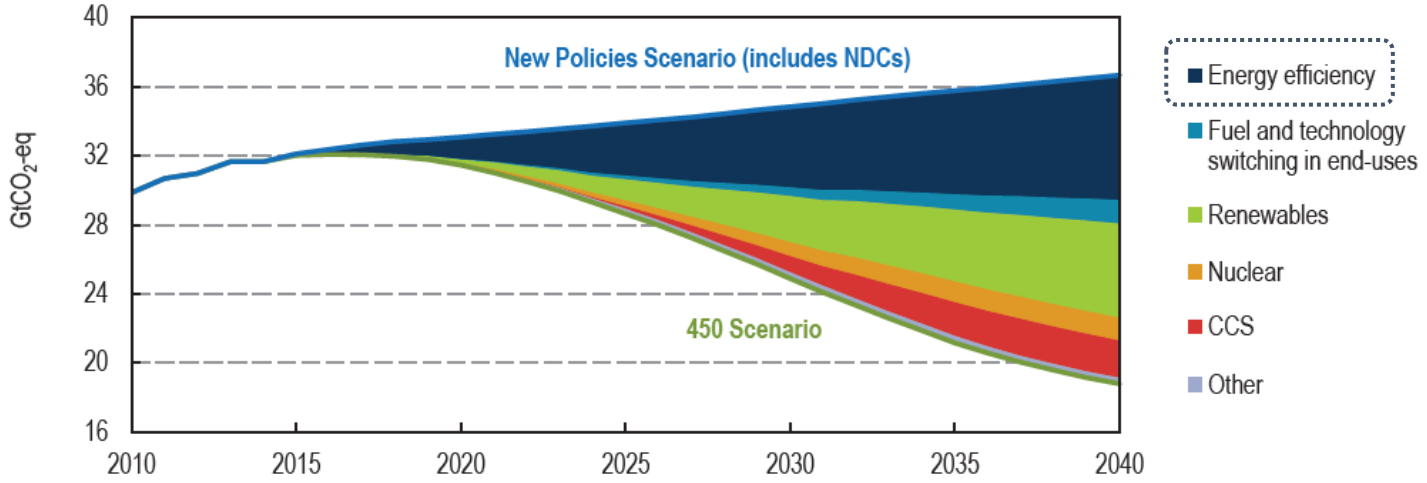
EEA (2018) *Approximated estimates for greenhouse gas emissions*, https://www.eea.europa.eu/data-and-maps/data/approximated-estimates-for-greenhouse-gas-emissions

1. Crucial role for energy efficiency

Chapter 5 • A central role for energy efficiency and other demand-side actions to reduce emissions

Energy efficiency contributes the largest share of total emissions reductions toward limiting temperature increase to 2 °C in International Energy Agency (IEA) analysis, surpassing even the role of renewables and revealing the importance of demand-side interventions. Energy efficiency, as well as structural changes and targeted energy conservation, are critical instruments to reduce emissions while supporting national targets for economic growth, poverty alleviation and improved standards of living through greater energy productivity. Keeping within reach the enlarged collective ambition of the Paris Agreement to mitigate climate change will require greater attention from governments to energy efficiency and other demand-side interventions.

Measures needed to surpass current NDCs to reach 2 °C trajectory (450 Scenario), through 2040



Note: The New Policies Scenario (NPS) is the central scenario of the World Energy Outlook *and includes the energy-related components of NDCs submitted by 1 October 2015.*

Source: Adapted from IEA (2015b), World Energy Outlook 2015.

IEA (2016), *Energy, Climate Change and Environment: 2016 Insights*, OECD/IEA, Paris.

1. Crucial role for energy efficiency

Energy Efficiency in Clean Energy Package

Clean energy for all Europeans package (*Clean Energy Package*, CEP) implements the **EU Energy Union Strategy (2021-2030)**:

Security, solidarity and trust	•Working in close cooperation with national authorities in order to diverse European energy sources and guarantee security of supply at all times.
An internal energy market fully integrated	• Energy must freely circulate in all EU, with no technical or regulatory obstacles, which will allow energy suppliers to freely compete, promote renewable energies and, at the same time, ensure energy at the best prices.
Energy Efficiency	• Putting energy efficiency first is a key objective in the package, as energy savings are the easiest way of saving money for consumers, for reducing greenhouse gas emissions and stimulate jobs creation and growth. The EU has therefore set binding targets of at least 32.5% energy efficiency by 2030.
Climate action: carbon free economy	• An ambitious climate policy is fundamental for the Energy Union. Actions include the EU emissions trading system (EU ETS), ambitious national emission reduction targets but flexible for sectors not in EU ETS, a script for low emissions transport and an energy policy that puts EU at the renewable energies world forefront. EU is committed at a quick rectification of the Paris Agreement, a new, ambitious and worldwide agreement about climate changes approved in Paris in December 2015.
Investigation, innovation and e competitiveness	• Support the investigation and innovation of clean energy technologies with low carbon emissions, in order to boost EU competitiveness.

Fonte: https://ec.europa.eu/commission/priorities/energy-union-and-climate_pt

1. Crucial role for energy efficiency

Energy Efficiency in the Integrated National Energy and Climate Plan

PNEC 2030: in order to achieve carbon neutrality by 2050 and in line with EU targets, targets are set for Portugal for the 2030 horizon.

	RESULTADOS 2016	META 2020	META 2030
EMISSÕES GEE 2030[1]	-22%	-18% a -23%	-45% a -55%
EFICIÊNCIA ENERGÉTICA[2]	23%	25%	35%
RENOVÁVEIS	28,5%	31%	47%
RENOVÁVEIS NOS TRANSPORTES	7,5%	10%	20%
INTERLIGAÇÕES ELÉTRICAS	8%	10%	15%

PPEC contributes to national goals!

(1) sem LULUCF; face a 2005; (2) Redução no consumo de energia primária sem usos não energéticos. Por comparação com as projeções do modelo PRIMES de 2007

Fonte: Ministério do Ambiente e da Transição Energética (2018), *Plano Nacional Integrado Energia-Clima: Linhas de atuação para o horizonte 2021-2030,* apresentação da sessão pública 28 de janeiro

1. Crucial Role for Energy Efficiency

2. PPEC (Electricity Consumption Efficiency Promotion Plan)

3. Final remarks

2. PPEC

How do regulation promotes efficiency in electricity consumption?

Through the definition of tariffs which induce an efficient use of electricity and other resources associated.

In order for this to happen tariffs should:

- recover all the "efficient" costs associated to each activity
- have several billing variables that convey accurate price signal to consumers
- have price structures adherent to marginal or incremental costs

Why have other type of mechanism?

Because of the barriers and market failures that hinder or prevent economic agents from taking efficient decisions:

- environmental externalities
- gap between supply prices and short term marginal costs
- information deficit
- large payback period and high individual discount rates
- agency problems

2. PPEC - Objectives and eligible promoters

PPEC

PPEC (Electricity Consumption Efficiency Promotion Plan) was established by ERSE (Energy Services Regulatory Authority) in 2006.

- Consists of a tender mechanism, by which eligible promoters submit candidate measures to improve efficiency in electricity consumption
- PPEC aims to promote a more efficient behavior on electricity consumption and the adoption of more efficient equipment by consumers of electricity

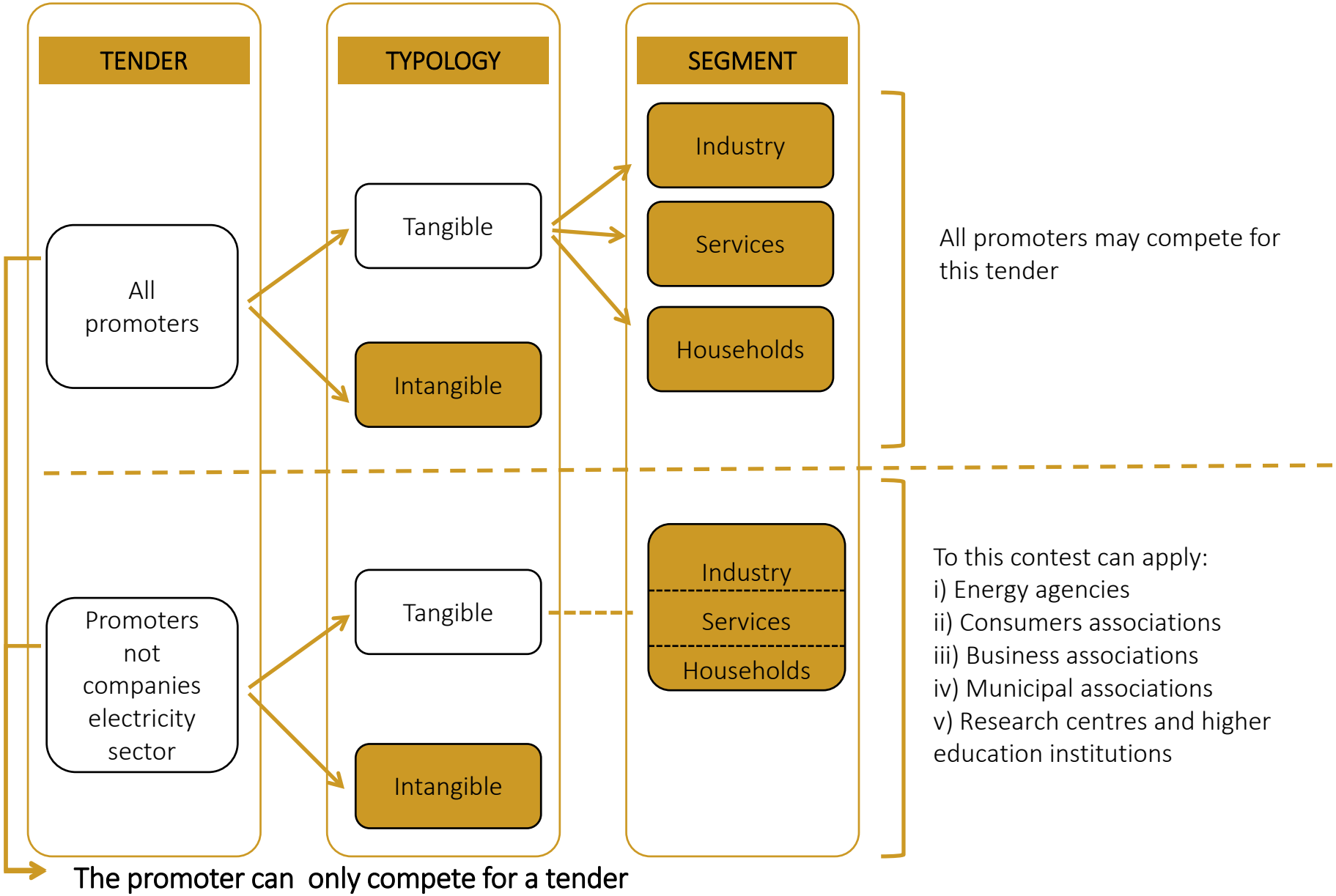
Eligible promoters

- Electricity suppliers
- Transmission and distribution network operators
- Energy agencies
- Consumers associations
- Business associations
- Municipal associations
- Research centres and higher education institutions

ERSE selects the candidate measures through technical and economic criteria publicly discussed and approved *ex-ante*.

DGEG selects the measures from the national energy policy perspective.

2. PPEC - Tenders

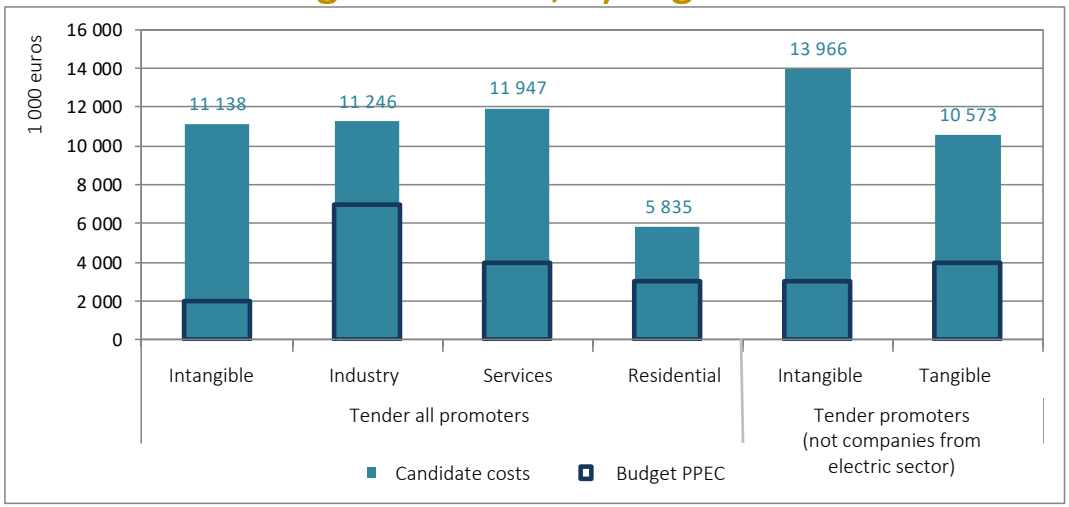


2. PPEC - Competitive tender

The success of the program – a lot of competition ….

So far five PPEC editions have been held. The sixth edition PPEC 2017-2018 is under implementation until the end of 2019.

Comparison between total candidate amount and budget available, by segment

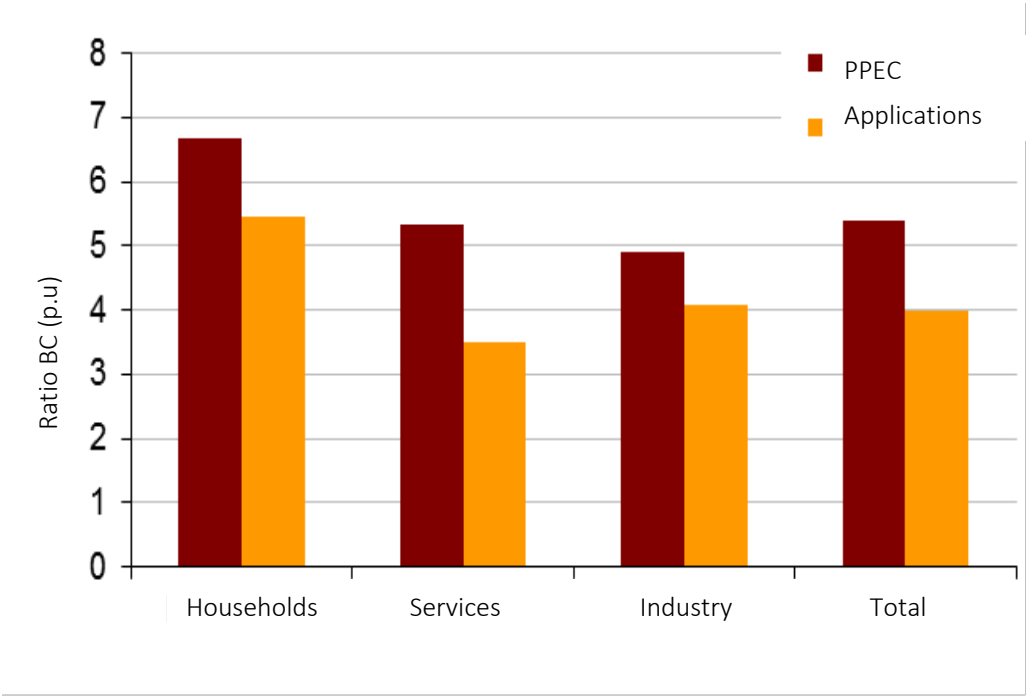


The candidate measures for PPEC 2017-2018 largely exceeded the budget available (23 million Euros).

PPEC is a very competitive tender, only the best measures win!

2. PPEC - Competitive tender

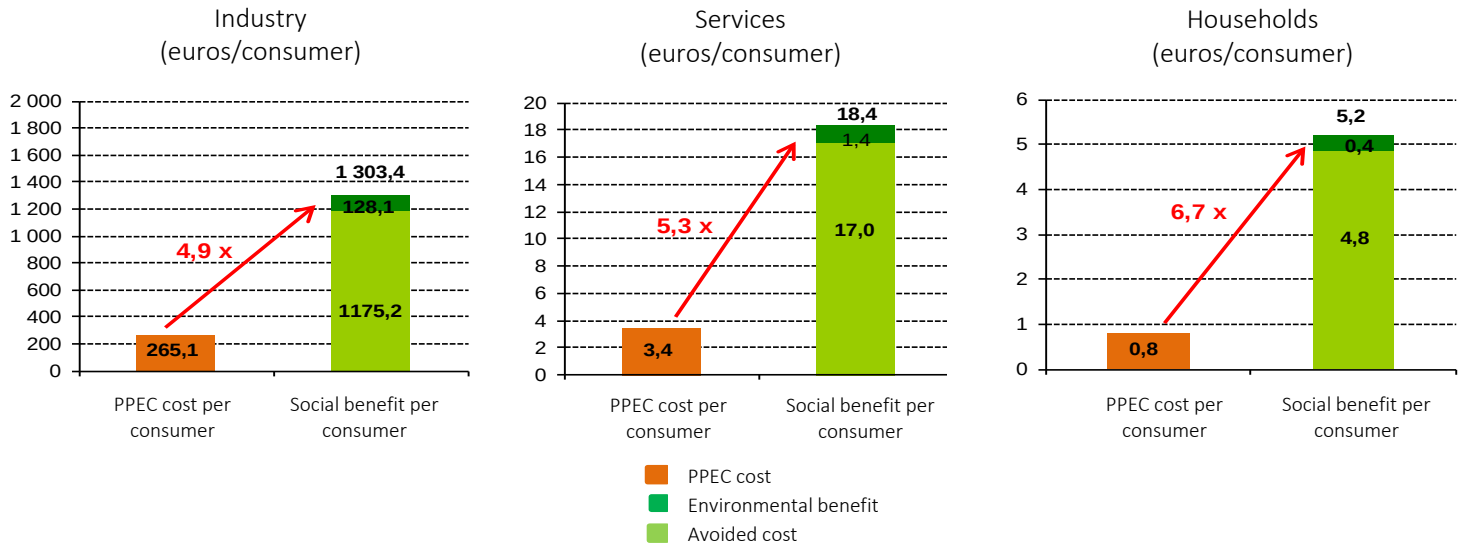
PPEC 2017-2018: Benefits outweigh costs…



Tender mechanisms have the advantage of being competitive mechanisms and as such, only the best measures with the highest benefit-cost ratio are selected for implementation. This way, PPEC ensures the maximization of social benefits per unit of incentive.

2. PPEC - Benefits and costs

PPEC 2017-2018: Benefits outweigh costs…



- ERSE estimates that benefits from 2017-2018 edition of PPEC with the implementation of tangible measures will be five times higher than costs
- Potential gains of 97 million are expected, for costs of 18 million

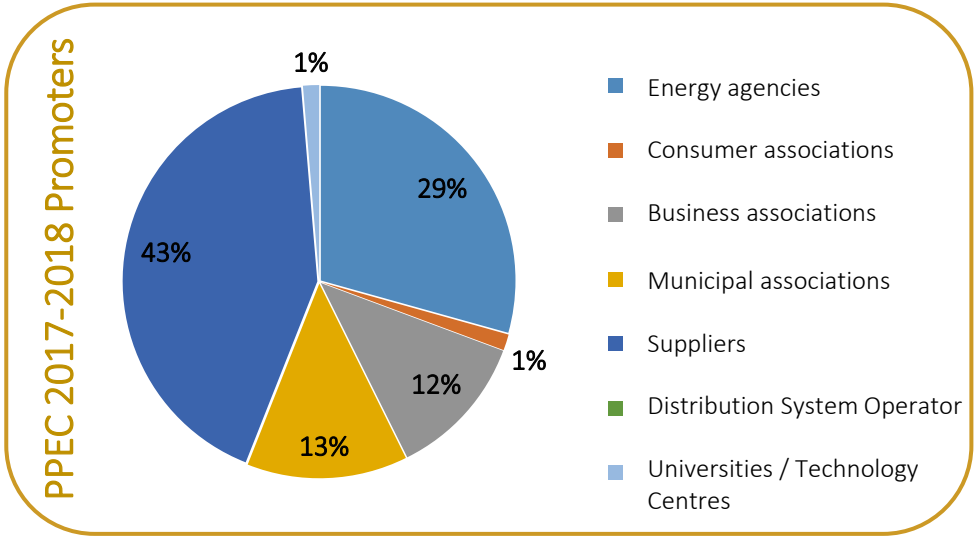
2. PPEC - Diversity of promoters

Put energy efficiency on the agenda of a broad range of players by fostering partnerships

- Very competitive mechanism, only the best measures are approved:
  - 224 applications were received from 87 promoters for the 2017-2018 PPEC
  - 75 measures were approved

- 32 lead promoters and 60 other entities (energy providers, consumers associations, business associations, municipal associations, universities, ESCO, environmental organizations, institutions of social solidarity, TV broadcasters…) are involved in the implementation of the projects selected

- Maximizing the number of players involved allows to reach more consumers and increase the positive spill-over effect



2. PPEC - Measures

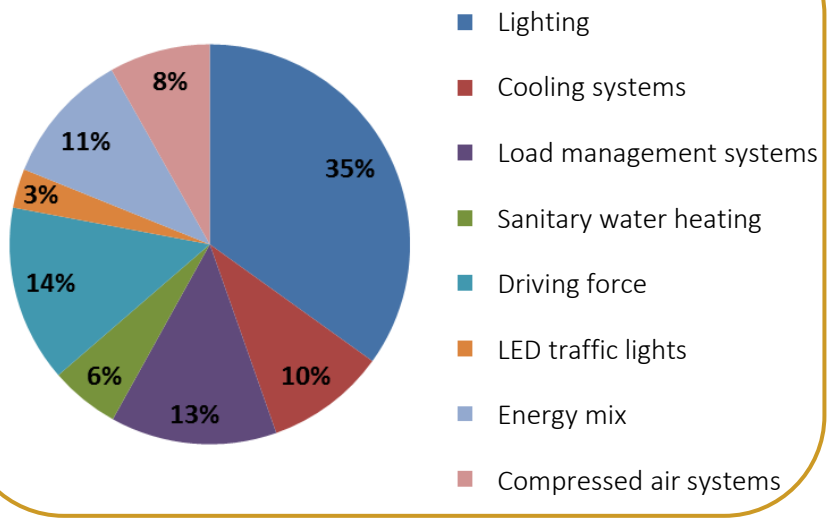
Tangible measures

Installation of equipment with a level of efficiency superior to the standard equipment on the market. Achieve measurable consumption reductions

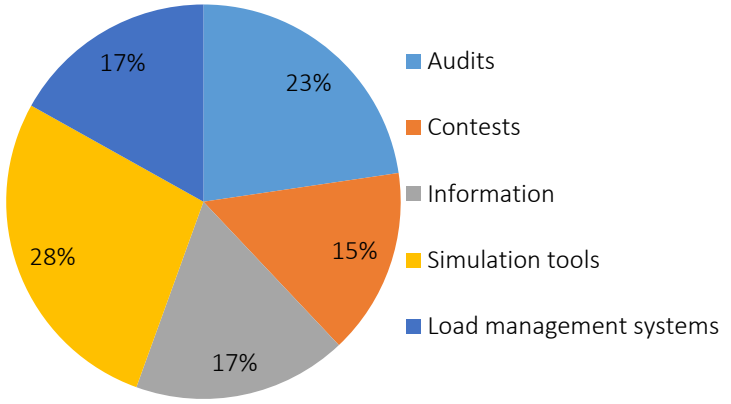
Intangible measures

Training and education that lead to application of energy-efficient technology and/or techniques. Focused information campaigns that promote energy efficiency improvement, Energy audits.

PPEC 2017-2018 approved tangible measures



PPEC 2017-2018 approved intangible measures



Examples of measures implemented - Public Administration

Public Administration measures are benefited on the selection process:

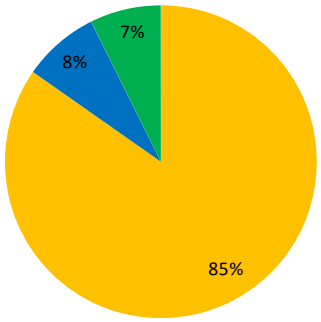
- Tangible Measures: Savings are more valued if measures are intended to Public Administration since it's a consumer group where barriers to behaviour changes are bigger and the gap between decision makers and who uses the equipment is higher
- Intangible Measures: The criteria Ability to overcome market barriers and spillover effect rewards measures intended to consumers group where market barriers are more pronounced, namely the Public Administration

Aplicação	Medida	Promotor
Hot water	BCEM – Heat Pumps at Municipal Buildings	AMCB
Motors applications	AVAC Sistems Optimization at Public Buildings	EDP Comercial
	Electronic Speed Variators	CIMAVE
Disclose of information	+ Efficient Parishes	RNAE
Load management	ECEE-State: Electric Energy Consumption Efficiency at the State	AREAM
	The Efficient	CIMLT
Lighting	Illuminte Municipal Buildings with LED	AREA
	LED Lighting at Public Buildings	CIMLT
	Public Lighting with LED	EDP Comercial
	LIE - LED inside the buildings	AMCB
	Master Lighting System	RNAE
	Ventilation Sistem Optimization of Lisbon Subway Network	Lisboa E-Nova
	Energy Optimization at Lisbon Camping Park	ATL
	West LED Traffic lights	Oeste Sustentável
	LED Traffic lights	EDP Comercial
	Combined Solutions of Eficient Lighting in Public Buildings	EDP Comercial

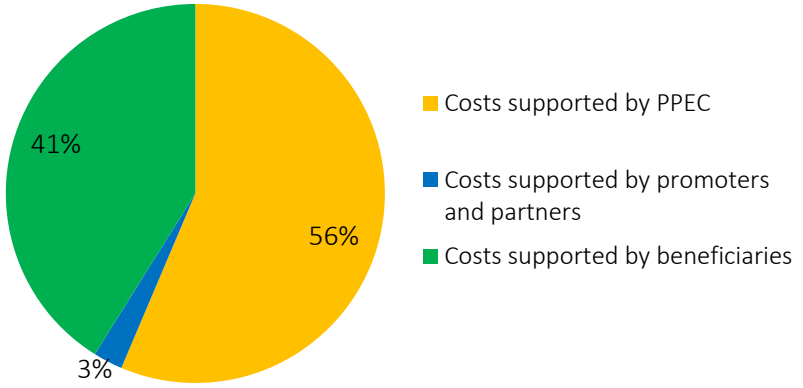
2. PPEC - Funding

PPEC Leverage the investment on Energy Efficiency

PPEC increased competition has enabled the level of co-financing from promoters and beneficiaries to increase, contributing to a higher involvement of all stakeholders.



PPEC 2007



PPEC 2017-2018

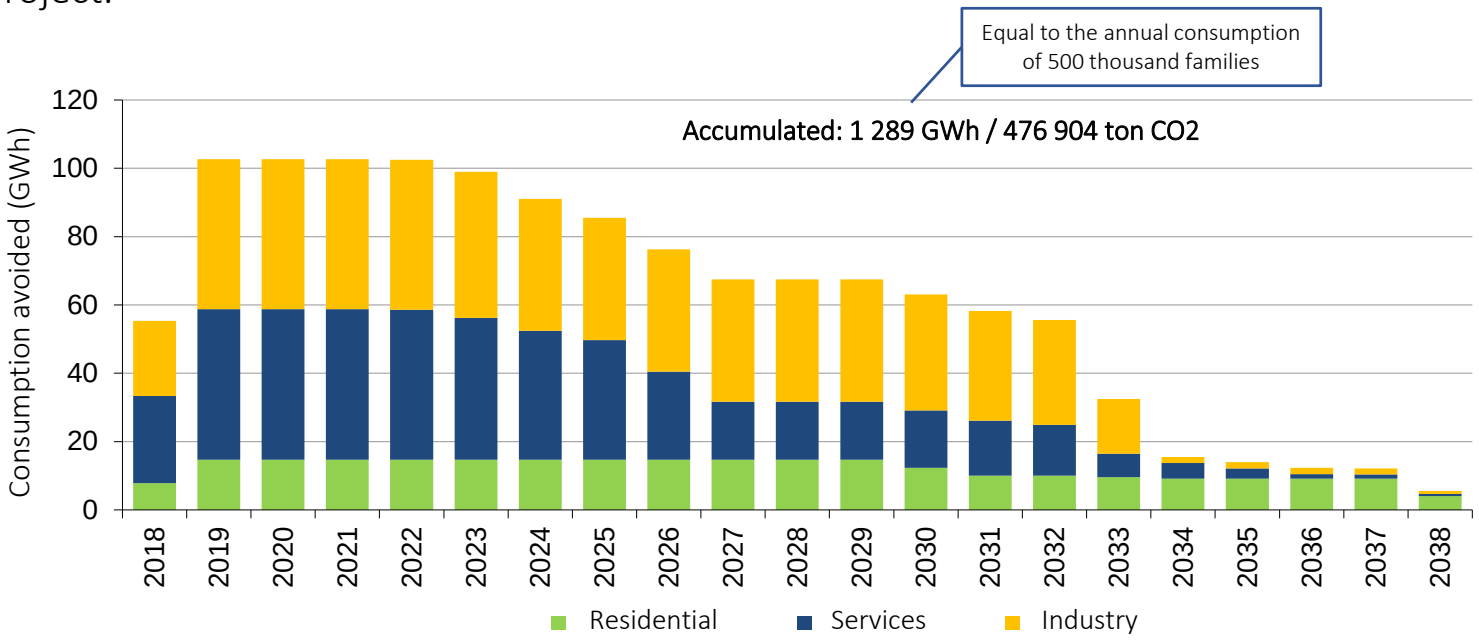
The funding needed for the implementation of PPEC 2017-2018 comes from:

- 23 million euros from PPEC (0,17% of electricity tariffs)
- 1 million euros from promoters and partners
- 17 million euros from beneficiaries

2. PPEC - The Process of Measurement and Verification

PPEC 2017-2018 Savings

- Candidate measures must include a Measurement and Verification Plan of energy savings, identifying the strategy to be used in measurement, to ascertain the impact of the measure.
- In the end of the implementation promoters have also to submit to ERSE the results of the measurement and verification plan, on the basis of which ERSE will verify the savings of the project.



The expected consumption avoided with the implementation of the measures approved by PPEC 2017-2018 have an accumulated value of 1 289 GWh, about 476 908 tons of CO_2

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- Importance of close cooperation between policy makers and regulators
- Ensure that regulatory incentives are closely aligned with the objective of energy efficiency
- Ensure that regulation is friendly to innovative new service providers
- Importance of bringing several entities for delivering energy efficiency (energy providers, consumers associations, municipalities, universities, ESCOs, institutions of social solidarity…) in order to maximize the number of agents involved, reducing the market failure to overcome, reaching more consumers and increasing the spill-over effect.
- Tender mechanisms for energy efficiency, as in the case of PPEC, represent a good practice for changing customer behaviour in favour of energy efficiency
- Rigorous ex-post evaluation of savings is important, discounting possible "rebound effect", and "free-riding effect" and avoiding double counting of savings via overlapping with other programs

3. Final remarks

- Rigorous ex-post evaluation of savings is important, discounting possible "rebound effect", and "free-riding effect" and avoiding double counting of savings via overlapping with other programs
- Energy efficiency is far more cost-effective than other mechanisms to meet environmental targets. *The best Megawatt is the Negawatt*
- ERSE is discussing in public consultation the revision of rules

Regulators ensure the crucial balance between

energy AVAILABILITY and energy AFFORDABILITY and thus have a

CENTRAL ROLE in the TRANSITION TO A LOW CARBON ENERGY SECTOR

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DOS SERVIÇOS
ENERGÉTICOS

EDIFÍCIO RESTELO
Rua Dom Cristóvão da Gama, 1, 3º
1400-113 Lisboa
Portugal
Tel: +(351) 21 303 32 00
Fax: +(351) 21 303 32 01 • **e-mail**: erse@erse.pt
url: http://www.erse.pt

For more information www.erse.pt