

The Ecobonus incentive scheme and energy poverty: is energy efficiency for all?

22 May2020

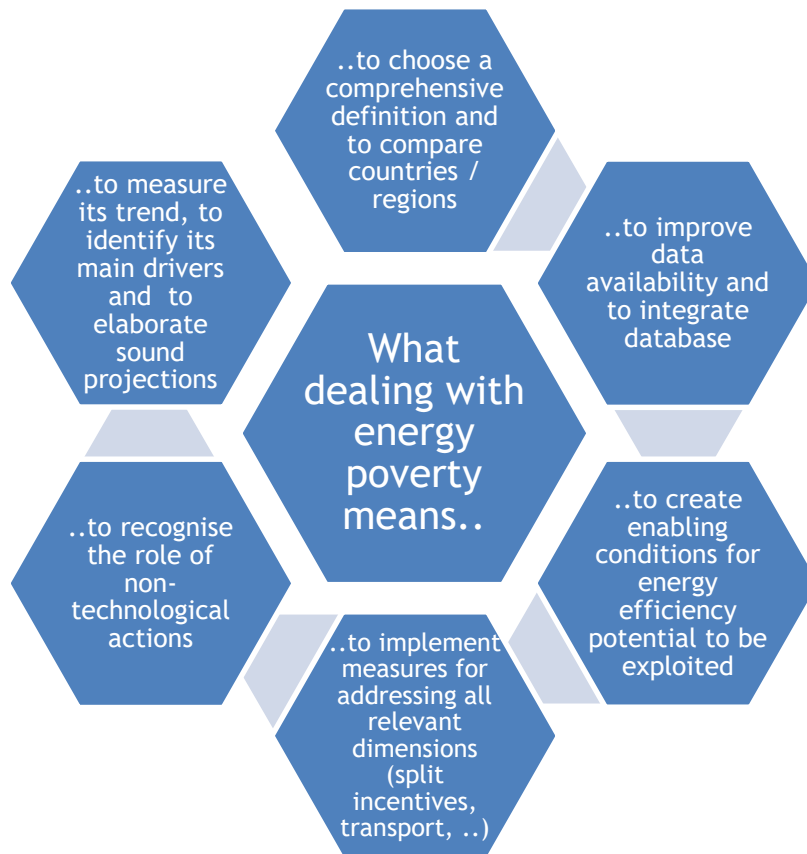
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Summary

- **Energy poverty in the EU**
- **Energy poverty in Italy**
 - Definition
 - Current trend and projections
- **Measures against energy poverty**
- **Ecobonus incentive scheme**
 - Functioning
 - National figures
 - Regional figures
- **Conclusions**

About energy poverty



With the *Clean Energy for All Europeans* package, the European Commission has proposed a range of measures to address energy poverty through energy efficiency, safeguards against disconnection and a better definition and monitoring of the issue at MS level through the National Energy and Climate Plans and Long Term Renovation Strategies Energy poverty is mentioned in

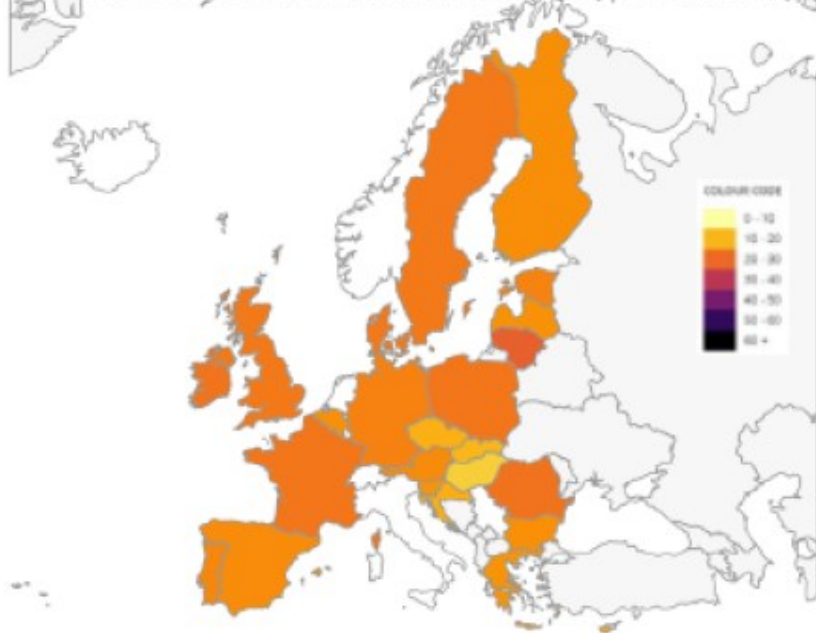
- Directive 2018/2002 (**new Energy Efficiency Directive**), art. 7
- Directive 2018/844 (**new Energy Performance of Buildings Directive**), art. 2
- **Governance Regulation** (2018/1999), art.3 and art. 24
- **Electricity Directive** (2019/944), art. 28 and 29

Definition and measure

- EPOV recommends using multiple indicators in combination
- EPOV 4 primary indicators
 - 1) High share of energy expenditure in income (2M): part of population with share of energy expenditure in income more than twice the national median
 - 2) Hidden energy poverty (HEP): part of population whose absolute energy expenditure is below half the national median
 - 3) Inability to keep home adequately warm: based on self-reported thermal discomfort
 - 4) Arrears on utility bills: based on households' self-reported inability to pay utility bills on time in the last 12 months
- EPOV secondary indicators are not directly related to energy poverty but include relevant information (e.g. energy prices or housing related data)
- Odyssée-Mure focus on fuel poverty is another useful data source
- Different measurement options are available → **DEFINITION MATTERS!**

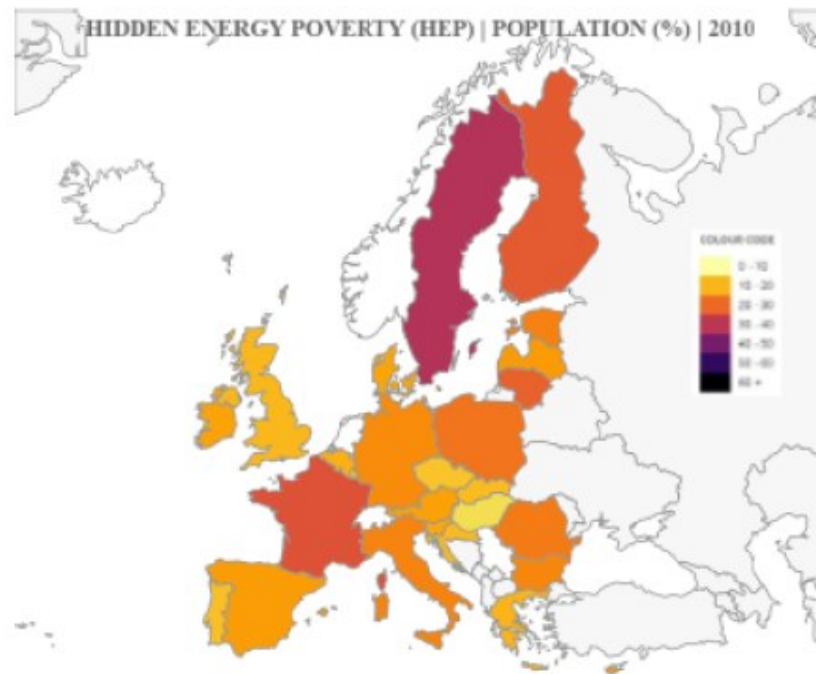
EPOV primary indicators (2M and HEP)

HIGH SHARE OF ENERGY EXPENDITURE IN INCOME (2M) | POPULATION (%) | 2010



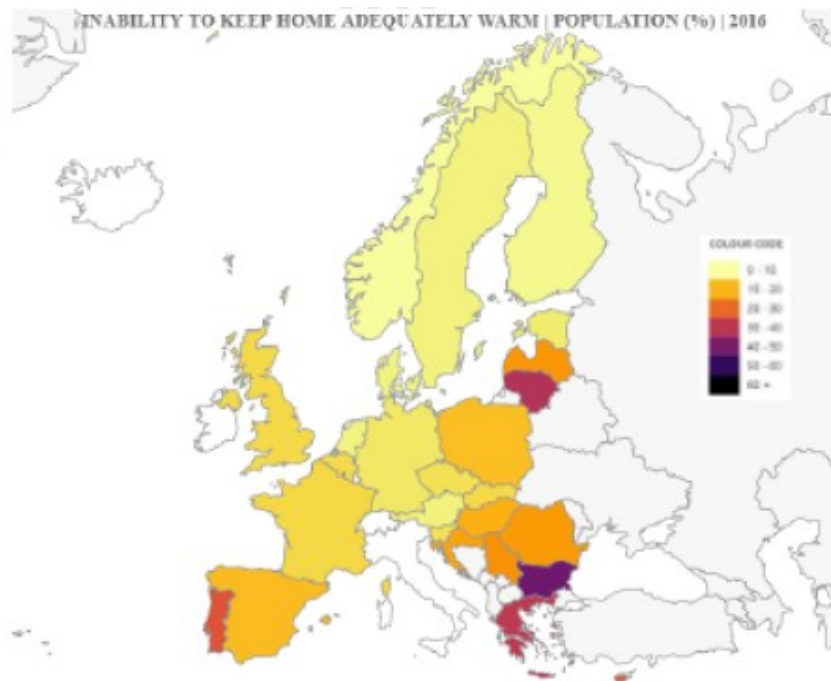
Source: HBS 2010

HIDDEN ENERGY POVERTY (HEP) | POPULATION (%) | 2010

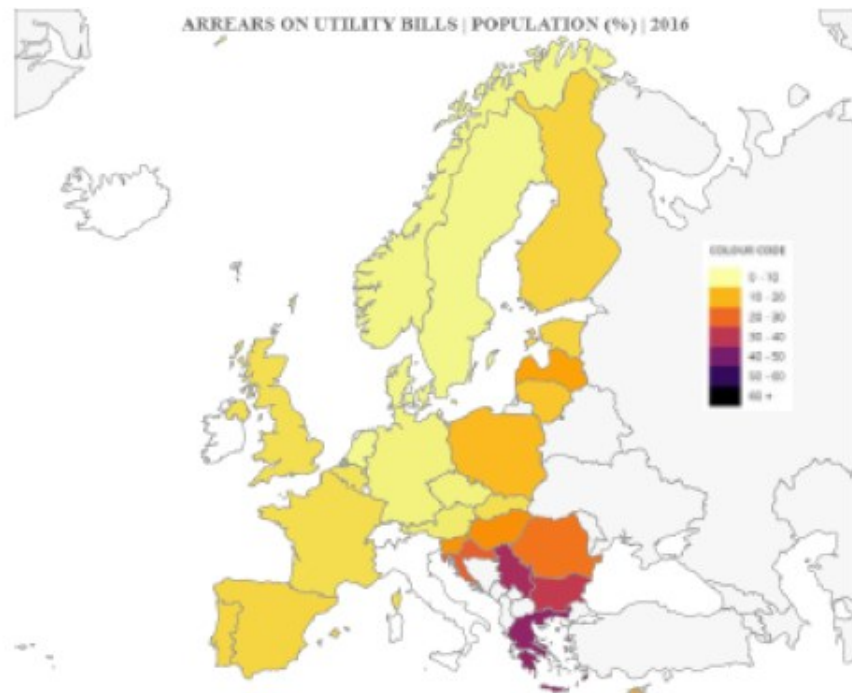


Source: HBS 2010

EPOV primary indicators (adequately warm and arrears)



Source: EU SILC 2016



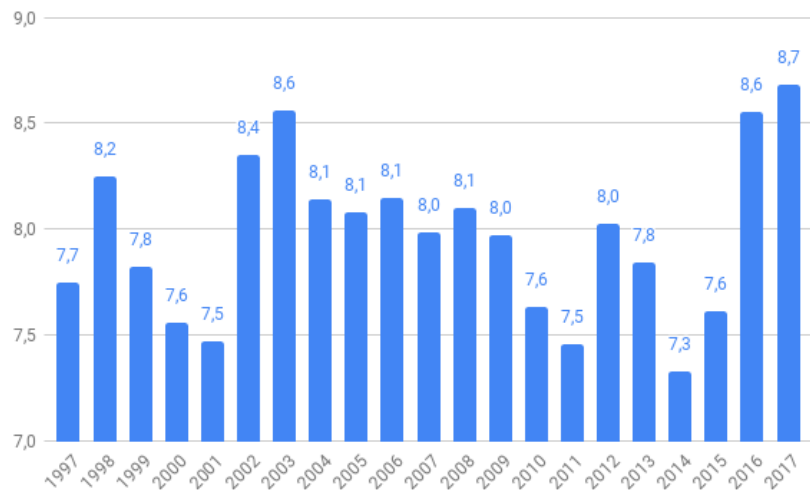
Source: EU SILC 2016

Energy poverty drivers - 1

- In the National Energy Strategy, and later on in the National Energy and Climate Plan, an ad hoc indicator was adopted
- The indicator is based on the work of two researchers from Bank of Italy *Faiella, I. and Lavecchia, L. (2015), "La povertà energetica in Italia", Politica economica, n.1, p 2776*
- The measure is a Low Income High Cost indicator, considering three dimensions
 1. a **share of energy costs** more than twice the average share of energy expenditure
 2. an **household budget**, after energy costs are deducted, below the national (relative) poverty line set by the National Statistical Institute
 3. **nul heating purchases** when total expenditure is below the median

Households in energy poverty - 1

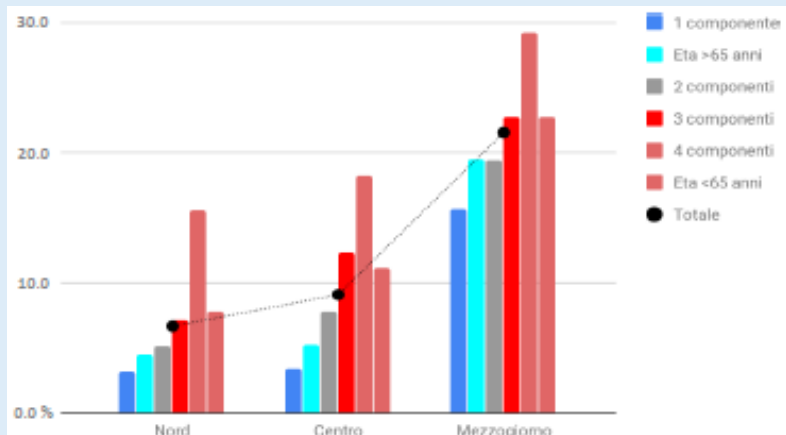
% of energy poor households on total population



- The number of households in energy poverty followed essentially the same trend as the number of households in relative poverty, according to estimates provided by Istat
- In 2017, **2.2 million of energy poor households** (more than 5 million persons), equal to 8.7% of total population
- This value is slightly higher than 2016 and the maximum in last 20 years
- Incidence is higher in **small municipalities** than in metropolitan areas or larger municipalities

Households in energy poverty - 2

% of energy poor households by household characteristics (2016)



Nord	North
Centro	Central
Mezzogiorno	South
1 componente	One member
Eta >65 anni	Age > 65 years
2 componenti	Two members
3 componenti	Three members
4 componenti	Four members
Eta <65 anni	Age < 65 years
Totale	Total

- Higher incidence in **Southern Italy** and in **larger households**
- In the period 2007-2017, the **share of energy expenditure on the total** has increased from 4.7% to 5.1%
- This share is higher (around 8%) and it has increased more (almost +1%) for households in the first quintile
- Energy poor households very often live in inefficient buildings and use **obsolete appliances**
- They are also likely to suffer **social exclusion problems** and overuse some appliances (tv on for even 11 hours/day)

- To identify targets for reducing energy poverty, it is important to understand its main determinants:
 1. expected price trends for energy products
 2. trends in overall household expenditure
 3. demographic changes
 4. trends in residential energy consumption and the associated mix
- **Renovation rate of building stock is also relevant!**

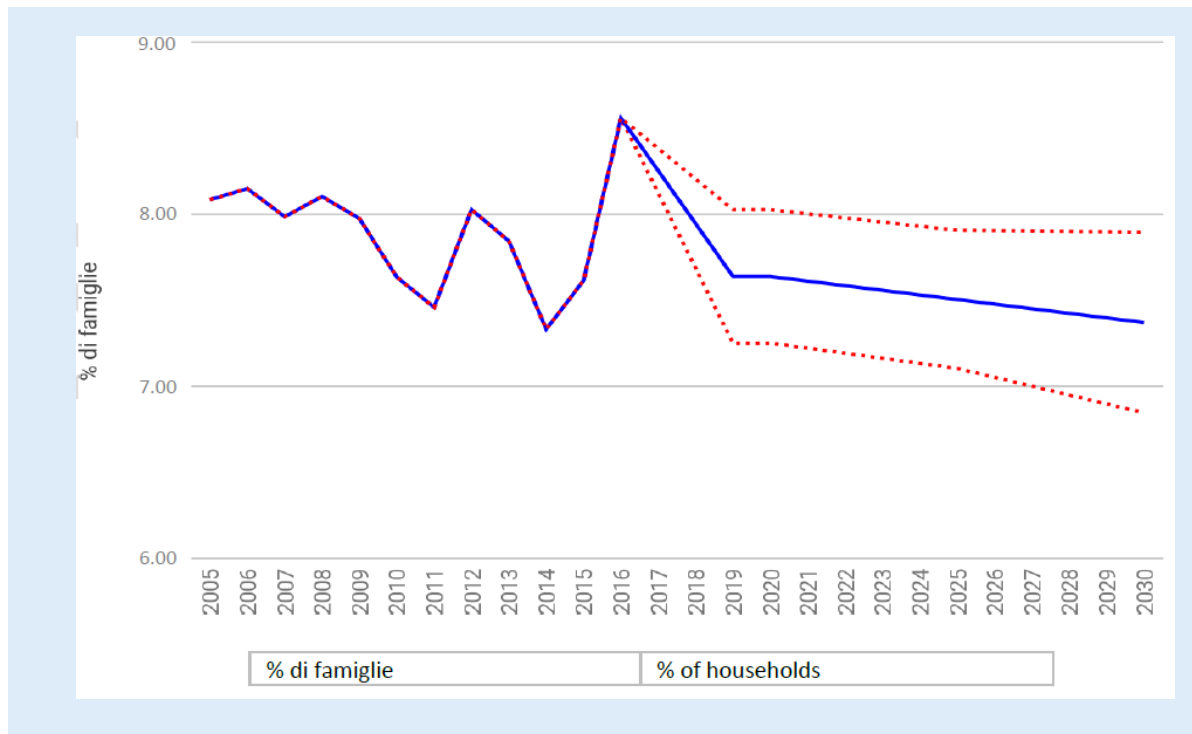
Energy poverty drivers - 2

- In the scenarios included in National Energy and Climate Plan (NECP)
 1. according to EU Reference Scenario 2016, the final price of electricity should increase by 0.6 % each year; no information is available on the price of gas or other energy products
→ overall, **energy expenditure could increase by 1.3 % each year**
 2. household **total expenditure could increase by an annualised rate of 0.8 %** if it follows the trends projected for real GDP in EU Reference Scenario
 3. households with an elderly member or with only one member are less likely to be energy poor, and their number would increase in the future: Istat projections show that the **number of people over the age of 65 should account for a quarter of the total in 2030**
 4. in 2030 **residential consumption should fall by 15.5 % compared to 2016**, with a growth in the electricity component (+7.2 %) against a reduction in gas (by almost a quarter) and a slump in oil products, which become marginal
- Energy renovation is partially related to last point
→ in the draft of Long Term Renovation Strategy (LTRS), we estimate that **an annual renovation rate in the range 0,8%-0,6%** is needed in the whole residential sector to reach the 2030 NECP objective

Energy poverty projections

- The incidence would remain essentially unchanged at a range between 7% and 8%
- Compared to the 2016 value there would be with a decrease of approximately one percentage point
- In level, a **decrease corresponding to approximately 230,000 households** compared to 2016

% of energy poor households by 2030 (central values and estimated range)



Measures to fight energy poverty

	Name	Description	Cost (€m - 2017)	Launch year
Social nature	Electricity social bonus	Electricity bill discount	104	2008
	Physical ailment social bonus	Electricity bill discount for people reliant on life-saving equipment	9	2009
	Gas social bonus	Gas bill discount	53	2009
Structural nature	Green social bonus	Tax deduction for the energy refurbishment of buildings	1 619	2007
Fiscal nature	Electricity deduction	Exemption from the excise due for the electricity used in residential buildings having a power up to 3 kW, for up to 150 kWh of electricity consumed per month	634	1993
	Heating deduction	Reduction in the price of diesel fuel and LPG used for heating in geographically or climatically less-favoured areas (mountainous areas, Sardinia, small islands)	159	1998

Ecobonus incentive scheme - Functioning

- Tax deduction on income tax paid by physical persons (or by companies)
- The tax deduction rate changes according to the eligible action considered
 - After the 2018 Budget Law, published at the end of 2017, **higher rate** for energy efficiency **actions on the building block** and also for **actions combined with anti-seismic interventions**
- 2017 Budget Law introduced the possibility of **tax credit transfer** (all eligible energy efficiency actions) for people in the no tax area, exclusively to suppliers who implemented works
- For people in the no tax area, the tax credit transfer has been extended to other private entities, banks and financial institutions by 2018 Budget Law

Ecobonus incentive scheme - Deduction rates

(^) Deduction for a single building unit.

(* If the actions are on the same real estate unit, the maximum deduction is equal to 60,000 euro.

(** If the action concerns the installation of several appliances, the maximum deduction is equal to 30,000 Euro, or to 100,000 Euro if a micro-co-generator is installed.

(#) Times the number of real estate units of the building.

346	Installing solar panels to produce domestic hot water	60,000.00		65%
347	a) full or partial replacement of heating systems with systems equipped with (**)	i. condensing boilers that are at least class A efficient	30,000.00	50%
		ii. condensing boilers that are at least class A efficient and require the installation of advanced thermoregulation systems	30,000.00	65%
		iii. condensing hot air generators	30,000.00	65%
		iv. high efficiency heat pumps, with low enthalpy geothermal systems	30,000.00	65%
		v. hybrid appliances with heat pump integrated with a condensation boiler	30,000.00	65%
		vi. micro-CHP systems	100,000.00	65%
		vii. replacing conventional water heaters with heat pump boiler for domestic hot water	30,000.00	65%
	b) installation of biomass heating system	30,000.00		50%
	c) installation of Building Automation systems			65%

Code	Action	Maximum eligible deduction (€) (^)	Maximum eligible expense (€)	Deduction (%)
344	Reduction of heating energy demand of the whole building	100,000.00		65%
345	a) insulation of vertical walls, roof, slabs (*)	60,000.00		65%
	b) windows and shutters replacement (*)	60,000.00		50%
	c) installing solar shades (*)	60,000.00		50%
	d) actions on common parts, involving over 25% of the dissipating surface of the building envelope		40,000.00 (#)	70%
	e) same actions as in d) to achieve at least the average quality as per tables 3 and 4 of Annex 1, of the Italy's Ministerial Decree 26/06/2015 "Guidelines for the Energy Certification Decree"		40,000.00 (#)	75%
	f) actions as in d) and e) implemented in seismic zones 1,2 and 3, aimed to reduce seismic risks also, resulting in one lower class of the seismic risk classification		136,000.00 (#)	80%
	g) actions as in d) and e) implemented in seismic zones 1,2 and 3, aimed to reduce seismic risks also, resulting in two or more lower classes of the seismic risk classifications		136,000.00 (#)	85%

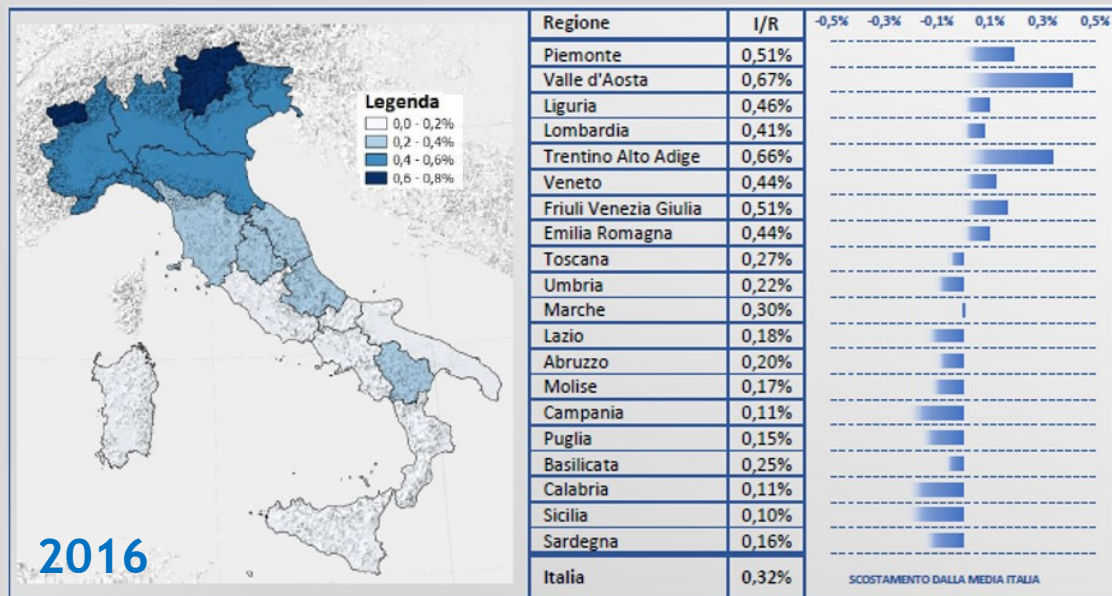
Ecobonus incentive scheme - National figures

- Cost-effectiveness indicator (€/kWh) shows better values for envelope insulation, windows and shutters replacement and solar panels
- Envelope insulation and windows and shutters are also the interventions associated to a higher share of savings
- Looking at technologies, also condensating boilers generate significant savings
- **Relevant share of investment for buildings built before 1980 (77%)**
- No information (yet) on whom has transferred the tax credit
- **At regional level, there is a clear correlation with net available income**

Interventions, investments and savings in 2018

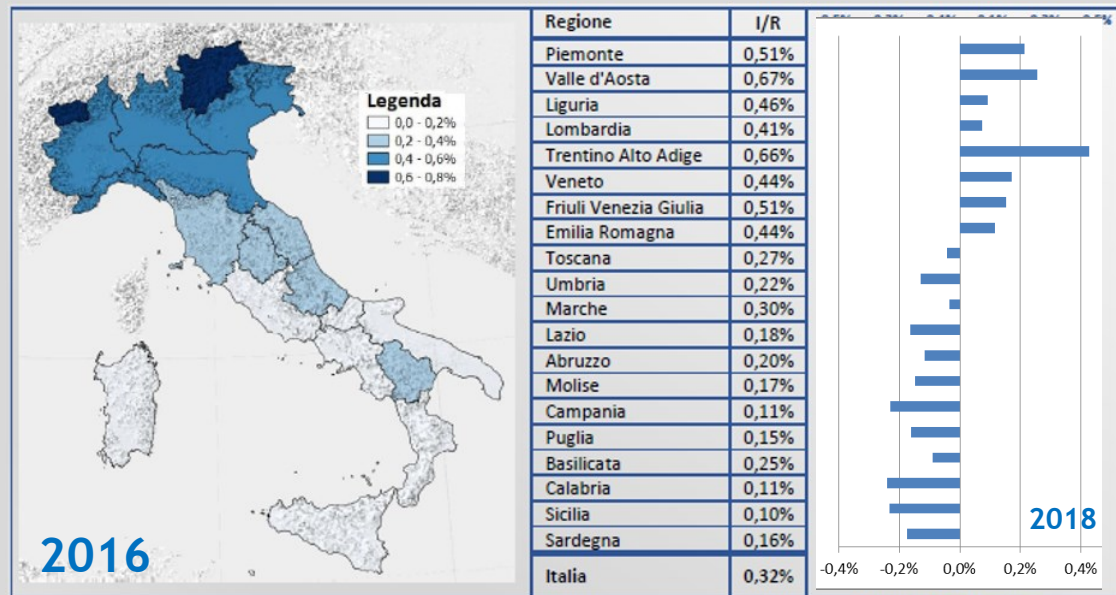
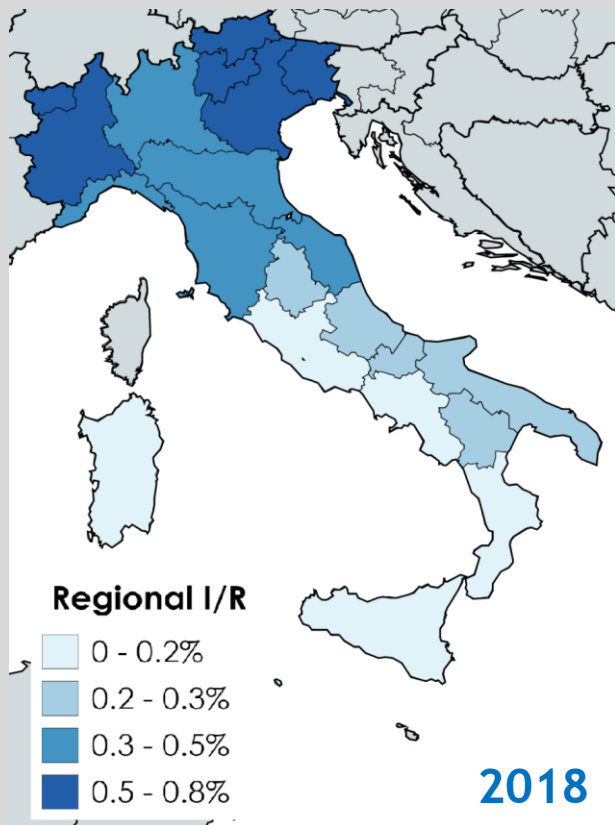
Eligible action	Interventions		Investments		Savings	
	(n)	%	(M€)	%	(GWh/year)	%
Building blocks	477	0.1%	55	1.7%	18	0.3%
Overall renovation	2,674	0.8%	249	7.5%	426	7.3%
Building envelope	25,267	7.5%	901	27.0%	1,621	27.7%
Windows and shutters	138,790	41.4%	1,072	32.2%	2,269	38.8%
Solar shading	70,491	21.1%	128	3.8%	75	1.3%
Solar panels	5,578	1.7%	36	1.1%	228	3.9%
Heating system	89,262	26.7%	873	26.2%	1,182	20.2%
Buildin automation	2,307	0.7%	17	0.5%	24	0.4%
Total	334,846		3,331		5,844	

Ecobonus incentive scheme - Regional figures



Ratio between total investments activated by Ecobonus and net available income by region (I/R) and deviation from the average, 2016

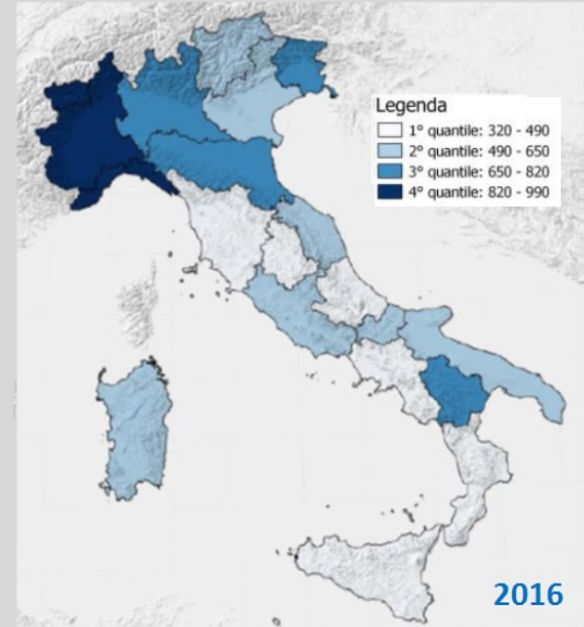
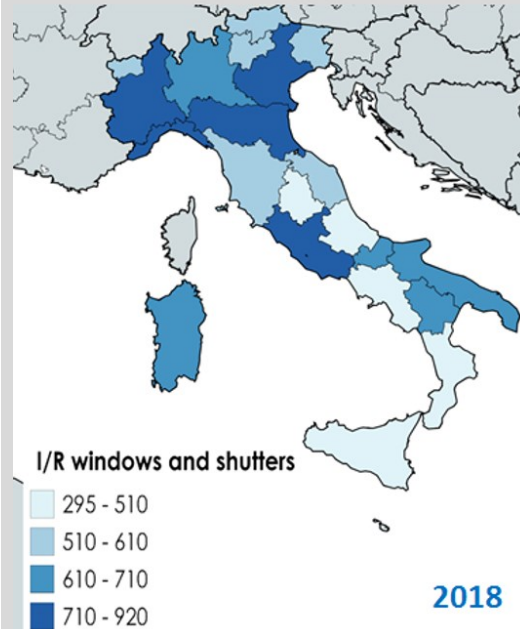
Ecobonus incentive scheme - Regional figures



Ratio between total investments activated by Ecobonus and net available income by region (I/R) and deviation from the average, 2016 and 2018

Regional figures - Correcting for possible climatic effects

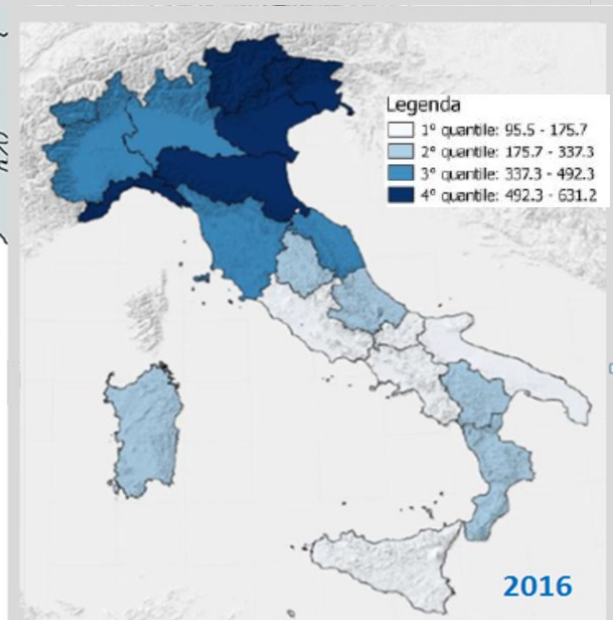
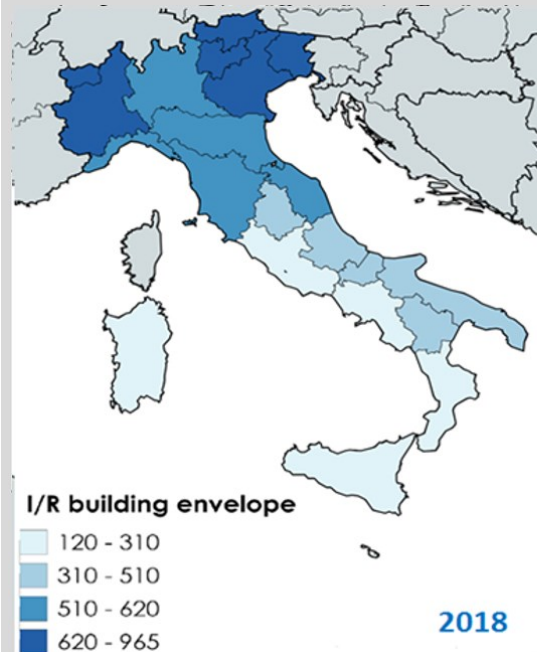
- Windows and shutters
- Building envelope
- Heating system



Ratio between investments activated by different comma of Ecobonus (normalised by regional HDD) and net available income by regions (I/R), 2016 and 2018

Regional figures - Correcting for possible climatic effects

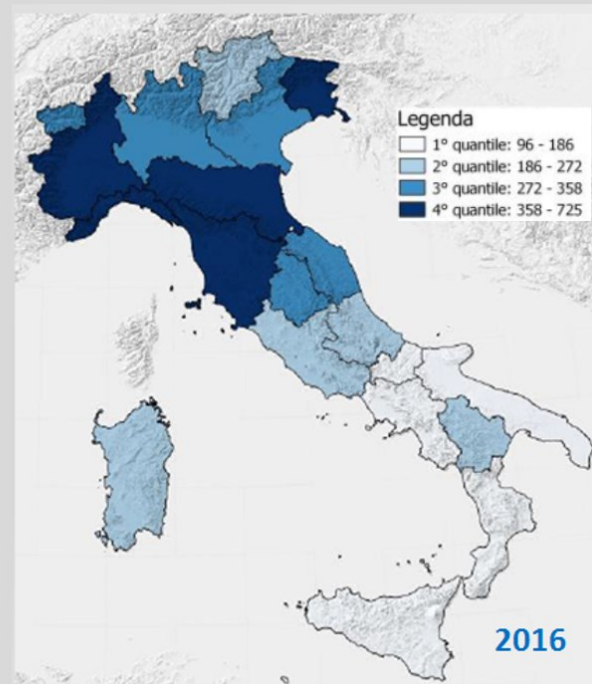
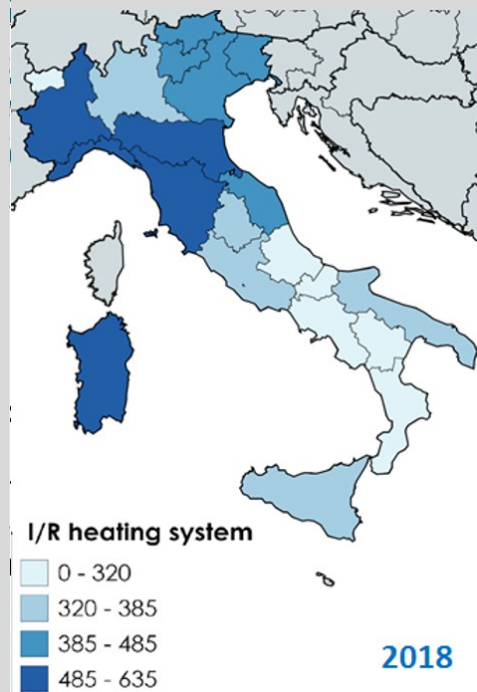
- Windows and shutters
- **Building envelope**
- Heating system



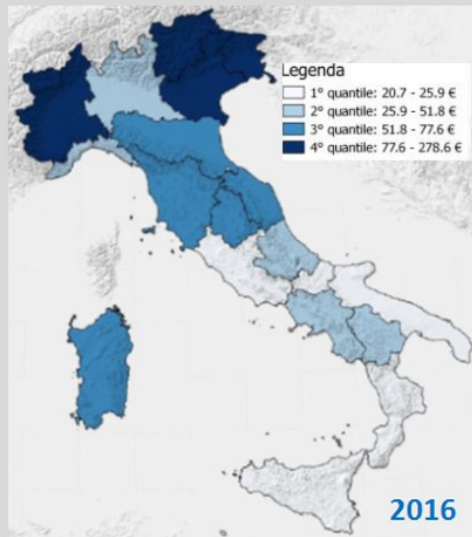
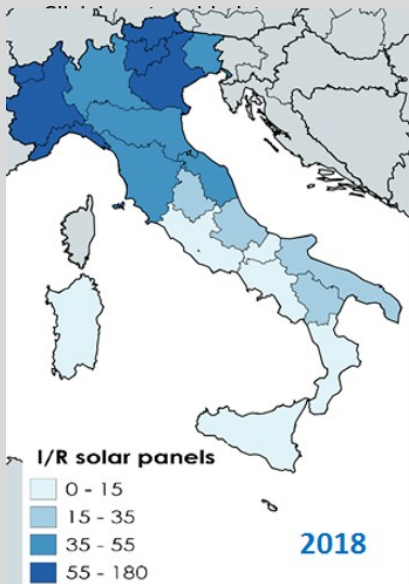
Ratio between investments activated by different comma of Ecobonus (normalised by regional HDD) and net available income by regions (I/R), 2016 and 2018

Regional figures - Correcting for possible climatic effects

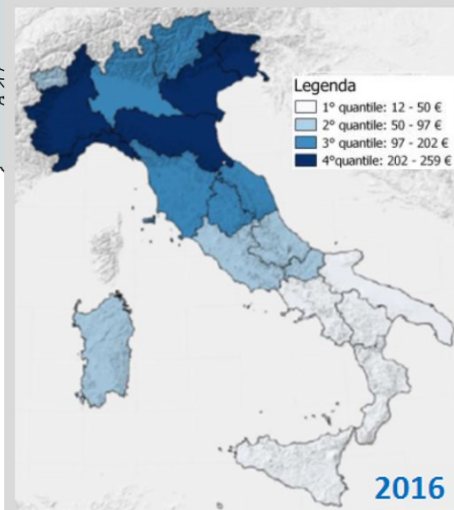
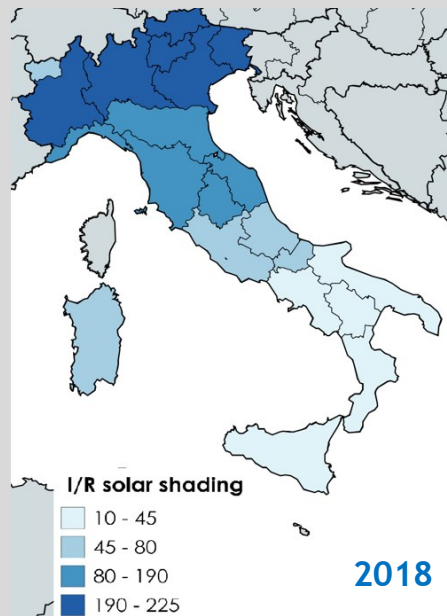
- Windows and shutters
- Building envelope
- Heating system



Ratio between investments activated by different comma of Ecobonus (normalised by regional HDD) and net available income by regions (I/R), 2016 and 2018



Regional figures - High technology potential is not enough



Regional investments activated by Ecobonus per million of net available income (I/R), 2016 and 2018

Ecobonus incentive scheme - General strategy in NECP

Energy indicators

- The results obtained through Ecobonus have been significant and so it is the saving potential
- The overall cumulated contribution of the measure to 2030 targets is around 18.15 Mtoe of final energy

Associated development trends

- The plan is to optimise the tax deductions schemes for energy renovation and for refurbishment of existing buildings, integrating them into a single scheme
- The scheme should provide a benefit scalable in relation to the expected saving, in order to reward those interventions with the best cost-efficiency ratio and to increase the trend towards deep renovation of buildings and seismic improvement
- Provisions aimed at promoting initial investments should be introduced, such as for example extending the transferability of the tax credit and implementing a guarantee fund on green financing issued by credit institutions

The European Energy Network (EnR) Position Paper

1. During the Italian EnR Presidency (February 2018-January 2019) a questionnaire was circulated, to update existing information on energy poverty and provide a useful basis to develop policy recommendations
2. Among the 19 contacted national energy agencies, 11 compiled the questionnaire:
Bulgaria, Croatia, France, Germany, Greece, Hungary, Italy, Portugal, Romania, Slovakia, United Kingdom
3. A position paper was prepared and sent to the European Commission
<http://enr-network.org/wp-content/uploads/ENERGYPOVERTY-EnRPositionPaper-Energypoverty-Jan-2019.pdf>
4. It provides **five policy recommendations** were provided, which will be described in next slides and could inspire further strategies to deal with energy poverty

1. Unique EU energy poverty measure, accompanied by country specific indicators

- Defining is key for measuring energy poverty, drafting targeted solutions and monitoring their results
- Own criteria for definition and measurement in each MS, and no harmonisation from the Commission
- Difficulties at country level in agreeing on a definition and usefulness of EU guidance
- An agreed EU definition would help in recognising the energy poverty problem and comparing different countries and regions
- A unique measure, accompanied by country-specific indicators, would be able to include all relevant dimensions and usefully inform data collection
- The identification of the most vulnerable households is essential for developing effective policy measures also at local level

2. Energy efficiency as key solution, with focus at local level

- Social policies, such as electricity and gas bonus, do not act on causes, only alleviate energy poverty
- Policy makers should focus on structural actions to promote energy efficiency solutions for energy poor households
- Energy poverty has adverse consequences on social exclusion and cohesion as well as on public health
- Translating multiple benefits of energy renovation into business plans is likely to shorten investments' payback period
- Poorest deciles are those where renovation actions are usually more urgent
- Policy measures should provide real incentives to low-income owners or tenants for energy renovation

3. Integrated approach for policy response

- EU guidance in definition and measure could be a facilitator for improving policy dialogue and coordination among institutions
- National observatories are the right place to share expertise and work together on common projects, such as database integration
- Two key roles for energy agencies
 1. to work at regional and local level to target the use of structural funds, with focus on
 - Highlighting differences in regional investments' needs
 - Providing information on different financing options and support for awareness raising campaigns
 2. to identify consumers eligible for measures against energy poverty, for example by looking at Energy Performance Certificates

4. Distributive impacts of existing energy and environmental policies

- Existing energy policy measures (e.g. EED art. 7 obligation scheme and alternative measures) could have differentiated impacts on income groups
 - Who is paying their cost?
 - Who has access to the financial incentives?
- Distributive effects of energy policies could be regressive: low income households may have a higher burden compared to richest ones
- In this case, compensation should be envisaged or policy reforms should be implemented
- With no adjustment, regressive effects of policy measures may worsen energy poverty

5. Training and information campaigns

- Acknowledged good practices in a given country or region may be unsuccessful elsewhere, simply because energy poor households are unaware of associated benefits
- Campaigns could contribute to boost renovation of dwellings owned or rented by energy poor households
- Different benefits of training and information campaigns
 1. To be key for coordination of relevant stakeholders
 2. To solve the inaction of energy poor households, who do not know where and to whom ask for support
 3. To enhance a more participatory process in developing policy measures, among administrations and between public and private entities
 4. To mobilise more financial resources from the supply side, and favour a wider and more cost-effective utilisation from the demand side

Best practices in Italy

- **Energy efficiency as key solution, with focus at local level**
 - Regional call for energy renovation of social housing, for example in Sicily region: nZEB reconversion and energy saving around 80%
 - Enershift project implemented in Liguria region, promoting Energy Performance Contract in social housing: investments for 15 mln Euro and savings of 3,500 ton of CO₂
 - Local initiative “Reddito Energetico” in Sardinia region: with the technical support of GSE and public financial support, installation of photovoltaic panels for electricity autoproduction
- **Integrated approach for policy response**
 - Automatisation of electricity and gas bonus
 - Initiative by electricity utility and Fondazione Cariplo in the city of Milan for financing energy efficiency actions in energy poor households
- **Training and information campaigns**
 - Sans Papier initiative in the city of Milan for the maintenance of heating systems in social housing and households in difficult economic conditions

Conclusions

- Regional gap in access to Ecobonus seems to be relevant and consistent with energy poverty incidence → further tailoring of the strategy proposed in NECP would be needed
- Very important how energy poverty is defined and measured
- Build on EnR **five recommendations** for the EU Commission
- Several **best practices** exists all along Italy
- Covid-19 pandemic has likely had and would have an impact on the number of energy poor households, as well as the permanence of households in this condition

..there is still a lot to be done!

Thank you for you attention!

For any further question please write to
chiara.martini@enea.it

If interested in the maps, they will be published in the proceedings of 3rd International Conference on “Smart and Sustainable Planning for Cities and Regions - SSPCR 2019”

<https://www.ssPCR.eurac.edu/>