

HEATING AND COOLING KNOWHOW AND SOLUTIONS



HACKS Final Event – 14 February 2023



Housekeeping points

- This conference is being recorded
- Guests are muted. If you have a question please use the chat at any point (send to: Everyone)
- Our moderator will read questions after each presentation
- Q&A at the end: if you wish to take the floor, please raise your virtual hand and we'll open your microphone

Programme overview

Session 1

- Methodology and Topten Approach
- 2 main work axes of HACKS
 - Research on best performing products : market analysis and how do policy makers view heating and cooling product evolution
 - Advice supporting citizens to improve their heating and cooling comfort

Session 2

- HACKS in practice: Reaching different target groups: citizens, manufacturers, installers, retailers, multipliers and the media
 - Dissemination first results at the European level
 - A selection of national highlights



HEATING AND COOLING KNOWHOW AND SOLUTIONS



Stamatis Sivitos

European Climate, Infrastructure and Environment Executive Agency
CINEA



HEATING AND COOLING KNOWHOW AND SOLUTIONS



Maxime Pasquier

Head of the Building Department
French agency for ecological transition - ADEME



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HACKS approach and impacts

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What is Tipten

- A concept born in 2000 to contribute to market transformation: more energy performant products designed, produced, proposed by retailers and chosen by consumers
- Continuous market study to identify best products available on the market and display precise information on-line, for free
- When the market makes progress in terms of efficiency, Tipten tightens its selection criteria to always select the best models
- Independent from suppliers and retailers



What is Topten

- More market transparency:
 - Show the efficiency benchmarks → EU level → Useful for policy makers
 - Show the technical issues → EU level → Different experts in the Topten network
 - Show which products are available in which country → National level →
Theoretically: 1 single EU market, in practice: 27 markets
- Topten's 2 pillars:
 - Technical information
 - Dissemination and partnerships so that our concrete content is used
 - Various stakeholders: governments, manufacturers, retailers, cities, utilities, schools, consumer and environmental NGOs, the media, etc.
 - Various activities: product lists, advice for different target groups, guidelines for professional buyers, simplified calculators for heating and cooling, raffles and competitions, labelling in shops/catalogues, rebate programmes based on Topten, etc.

Best products in your country



 Austria	 Norway
 Belgium	 Poland
 Czech Rep.	 Portugal
 France	 UK
 Germany	 Spain
 Italy	 Sweden
 Lithuania	 Switzerland
 Luxembourg	

15 countries working together since 2006

- European portal for researchers and policy makers www.topten.eu → Benchmarks, policy recommendations
- National portals → Which are the best products on *your* market, now



The great HACKS opportunity

- With HACKS, support of H2020 and several governments
- Open Topten to the heating and cooling sectors
- Adapt our thinking and activities:
 - Complex messages for communication (not just “plug and play”)
 - Building insulation and passive solutions should come first
 - But once a decision is made for a technology, there are still tremendous energy consumption differences between products
 - Take care of installers and retailers

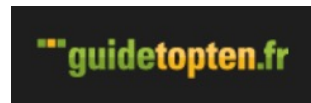


THANK YOU FOR YOUR ATTENTION!

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 845231.

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HEATING AND COOLING KNOWHOW AND SOLUTIONS











Market Analysis: Topten Products lists' benchmarks.
How did most energy efficient heating and cooling products evolve





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Overview HACKS categories on Topten.EU

	Category	Models April 2020	Models February 2023	Index %
	Air Conditioners	98	90	92
	Circulation Pumps	196	148	76
	Comfort Fans	93	120	129
	Heat Pumps	248	275	111
	Local Space Heaters	8	43	538
	Solid Fuel Boilers	23	78	339
	Taps & Shower Heads	49	81	165
	Water Heaters (Heat Pump)	52	60	115
	Total	767	895	117

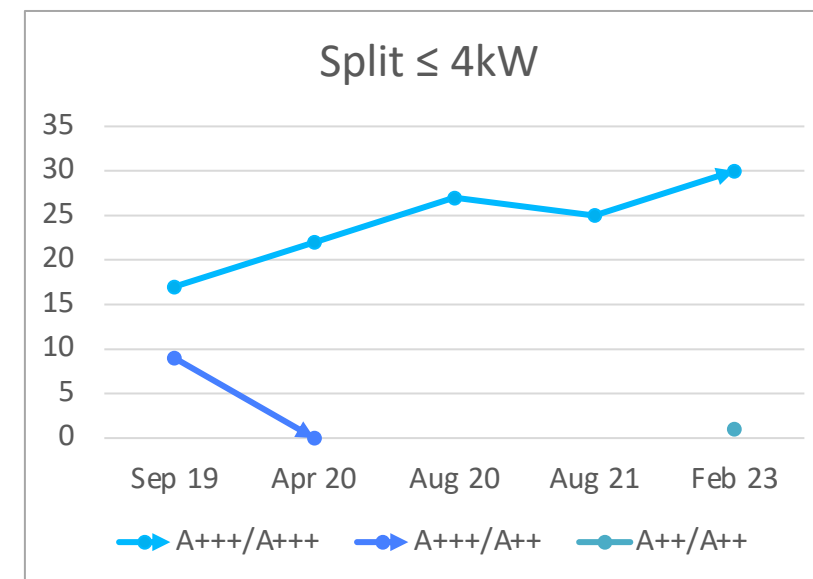
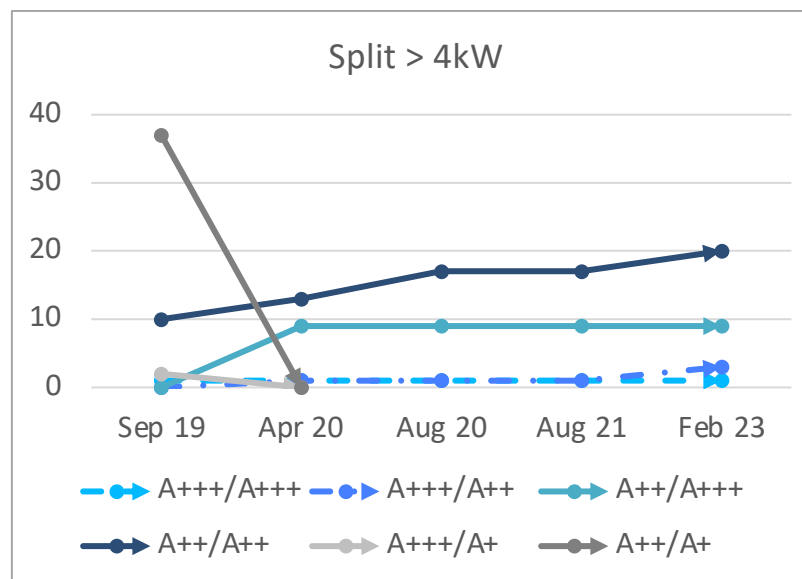
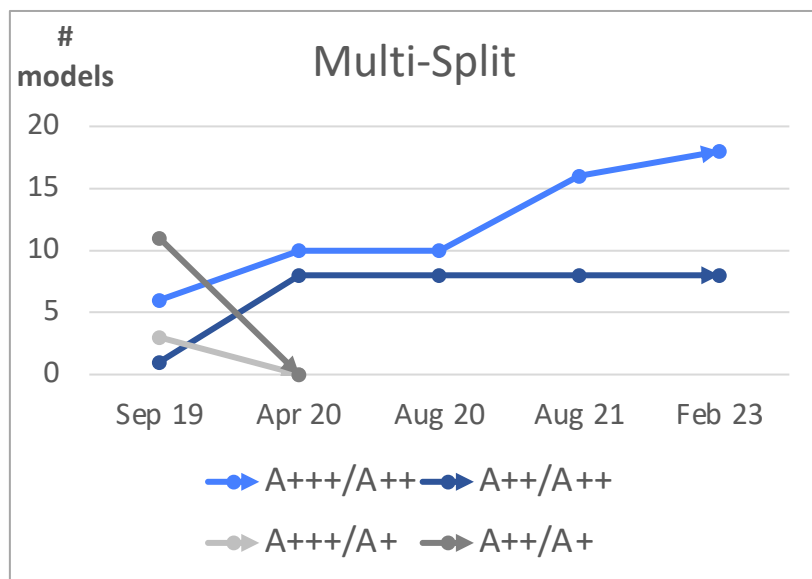
Tightening of Selection Criteria during Project

	Category	Timing	Background
	Air Conditioners	Apr20	Higher efficiency classes for all three types of ACs and introducing a minimum requirement for the global warming potential of the refrigerants used.
	Circulation Pumps	Apr20	From maximum efficiency index 0.20 to 0.18. Driver: overall market progression towards more efficient devices.
	Heat Pumps	May21	From A+ to A++ and including the mandatory declaration of the η value (energy efficiency). Driver: more efficient products available in the higher classes
	Water Heaters	Feb22	From A to A+. Availability of the energy label for water heaters has become increasingly common in recent years and because the EU label is more familiar to consumers.

Focus: Air Conditioners

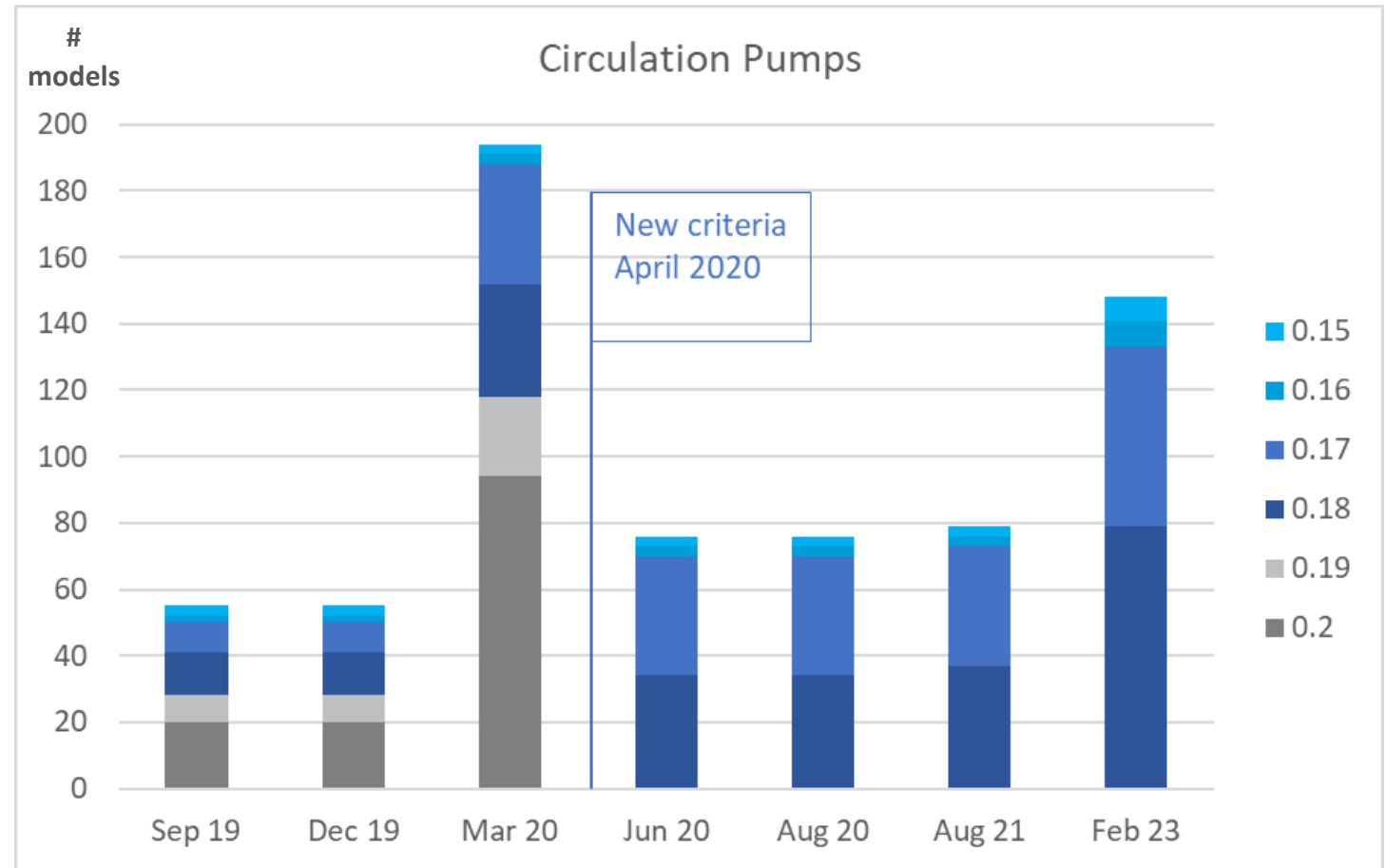
- Stricter criteria as of April 2020, and introduction of GWP requirement
- Upwards trend in efficient models

- No Multi-split in highest class (A+++/A+++) available yet
- Split $\leq 4\text{kW}$ all in highest class



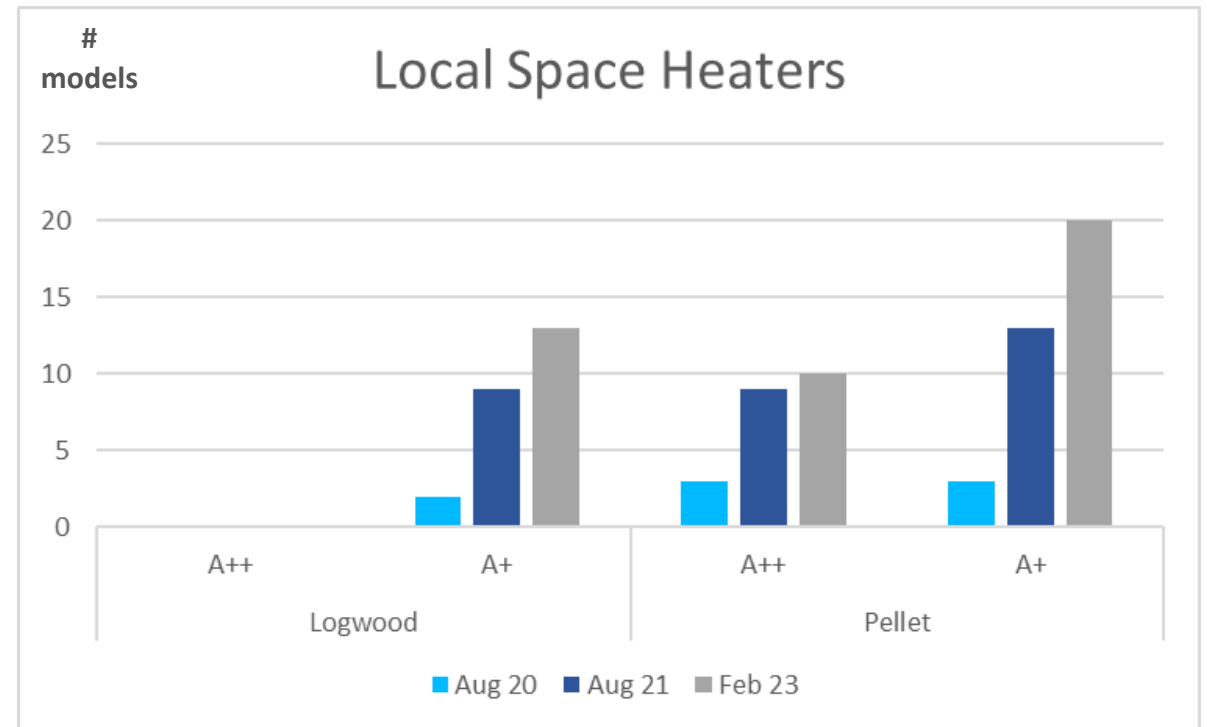
Focus: Circulation Pumps

- New criteria as of April 2020 with loss of many models
- By Feb23, the market as a whole improved in efficiency.



Focus: Local Space Heaters

- **Lack of declaration discipline** across EU markets for LSH → low data availability
- Aug'20 to Aug'21:
Big uplift in models through Italian incentive scheme requiring comprehensive data documentation and publication
- Aug'21 to Feb'23:
Further uplift in models with the **enforcement of Ecodesign requirements** as of January 2022



Outlook on Selection Criteria

- Stricter criteria coming later in 2023 for...
- ... Air Conditioners
 - sub-group of Split-devices with ≤ 4 kw cooling capacity
 - 99% of Topten models in highest class A+++ / A+++
- ... Heat pumps
 - Significant shift towards highest class A+++ within last year
 - Key driver was the type Air-to-Water (heat source)
 - 2021: 50% A+++ / 50% A++
2023: 80% A+++ / 20% A++

What drives efficiency in the markets?

Various **types of innovation** helping to drive efficiency of Heating & Cooling:

- system change (fossil to heat pumps)
- **technology innovation** (such as variable speed drive)
- incremental technical innovation (improved aspect of an existing product/technology)

Example: variable speed drive

- Used in Circulation pump motors
- Saving potential more than 75% annual energy consumption vs old inefficient models
- Built in every circulation pump since early 2010s

Why still relevant today though?

- Circulation pumps have very long life-span (2-3 decades)
- Today in 2023 many houses still with old pumps

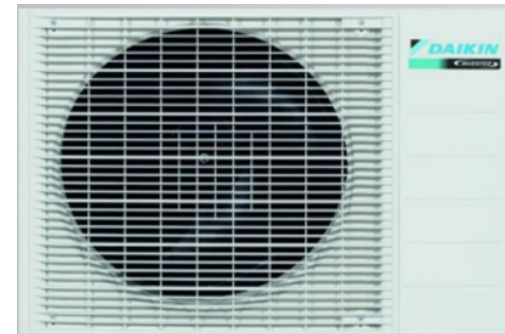
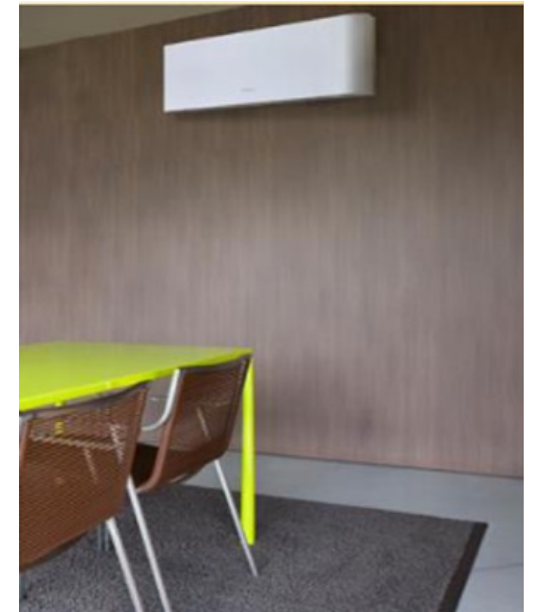
Role of Topten

- Topten's role in this innovation process is to help exploit the potential of above innovations and accelerate the dissemination of efficient products
- Methods among others: promoting products, publishing product lists, subsidy programs, involvement of stakeholder as multipliers
- Most important aspect here: Promoting **replacement of old circulators with modern pumps**.



Heating with Air Conditioners – niche or large potential?

- Good solution to heating in given circumstance where
 - **No central heat distribution network** is available or retrofitting is not cost-effective
 - Only alternative is direct (resistance) electric heating
- **Tried and tested mass product**, low product and installation costs
- **Saving potential: in the order of magnitude 3x** compared to electric heaters, (Air-to-air heat pump)
- Use cases: holiday homes, cottages, small apartments, and even regular primary household in the Nordics or Iberia.
- Topten currently undertakes a study of this topic.
- Product list for ACs for Heating started on Topten.EU



Topten at forefront of market development

- Topten always strives to be at the forefront when it comes to new technology.
- We scan the markets and find new products, that are trending. Such an example are **Plug & Play solar panels** for your balcony (topten.eu/solar)
- **Typical steps**: We study them. Understand them. Determine selection criteria. Publish market overview. Inform authorities / regulators about potential issues and aspects to consider.
- Currently: No EU-wide regulations for Plug & Play solar systems.
- **Policy-making**: If then needed, Topten can provide these market data and benchmarks to assist in data-driven policy making.



THANK YOU FOR YOUR ATTENTION!

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HACKS conference, 14/02/2023

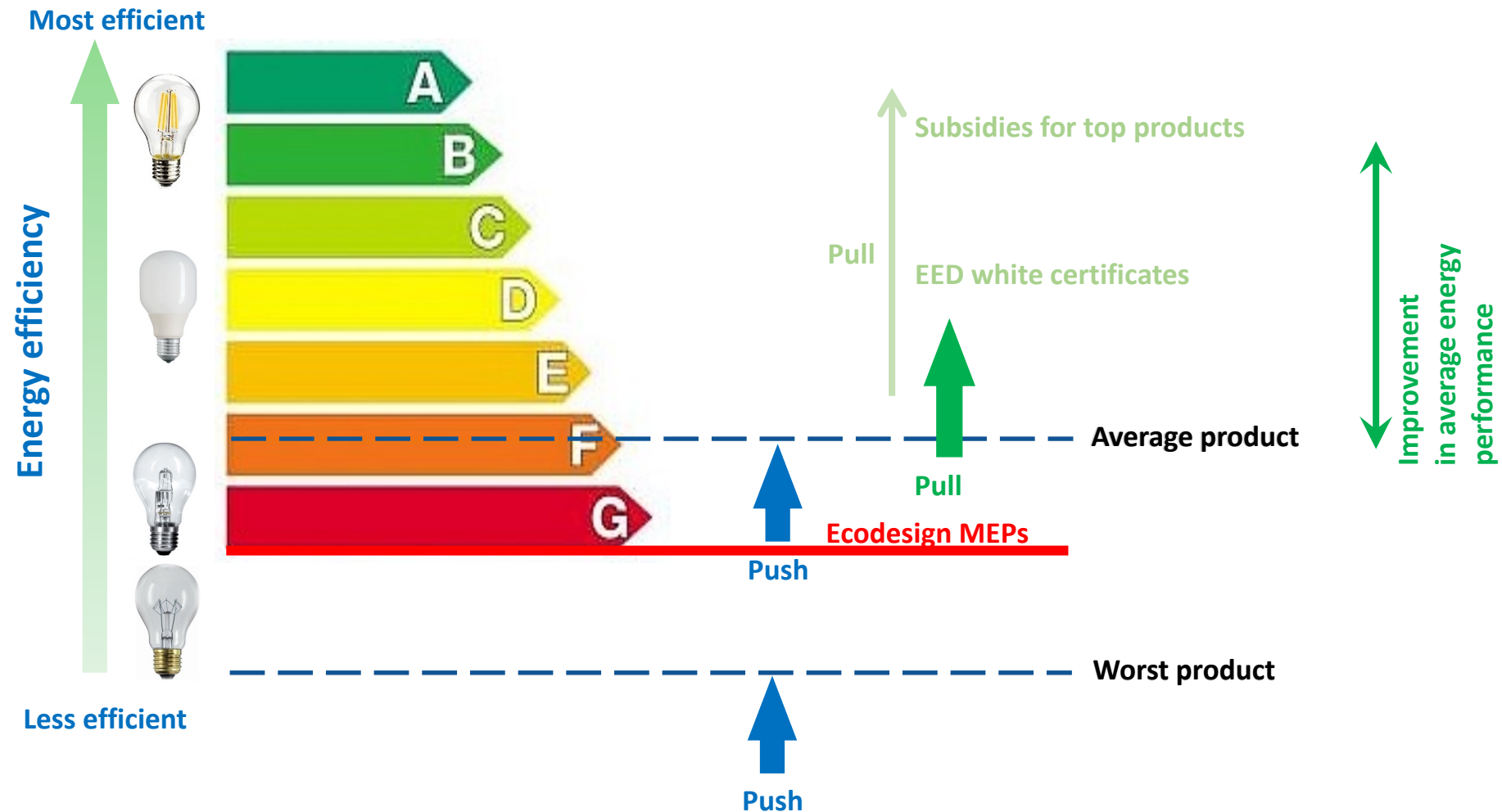
Evolution of heating and cooling product policies

Philippe Rivière
European Commission, DG ENER
Unit B3: Buildings and products

Standards & Labels programs - Principles

Ecodesign:
Targets **producers/retailers**
Pushes the market (models)

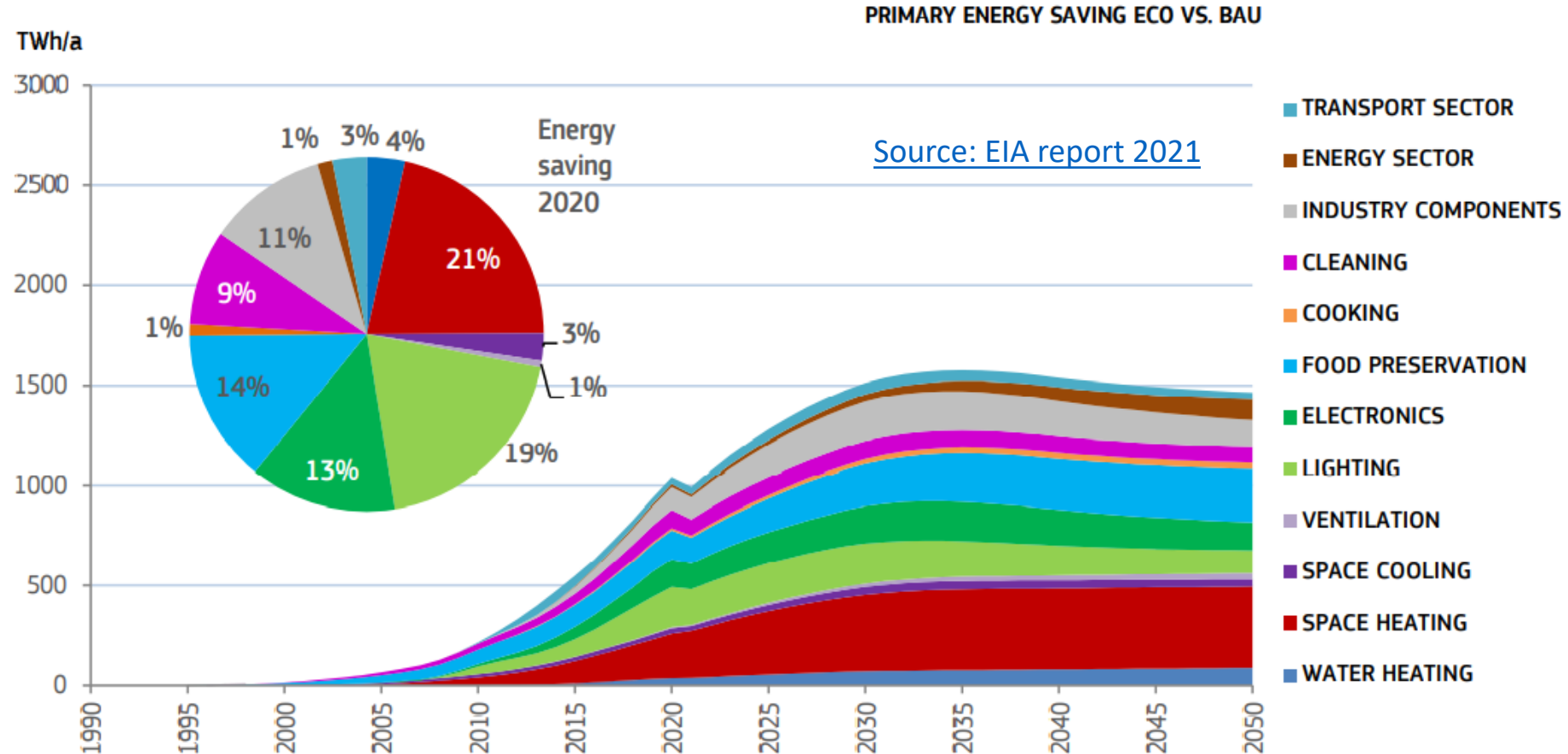
Labelling:
Targets **consumers**
Pulls the market (sales)



Overview existing space heating and cooling regulations

		Ecodesign	Energy label
Space heaters that heat air directly	Air-to-air heat pumps ≤ 12 kW	(EU) No 206/2012	(EU) No 626/2011
	Air-to-air heat pumps > 12 kW	(EU) 2016/2281	N.A.
	Warm air heaters		
	Local space heaters ≤ 50 kW	(EU) 2015/1185	(EU) 2015/1186
		(EU) 2015/1188	
	Local space heaters ≤ 120 kW	(EU) 2015/1185	N.A.
		(EU) 2015/1188	
Hydronic Space heaters that heat water to heat spaces	Space heaters (boiler type) ≤ 70 kW	(EU) No 813/2013	(EU) No 811/2013
	Space heaters (boiler type) ≤ 400 kW	(EU) No 813/2013	N.A.
	Solid fuel boilers ≤ 70 kW	(EU) 2015/1189	(EU) 2015/118 7
	Solid fuel boilers ≤ 500 kW	(EU) 2015/1189	N.A

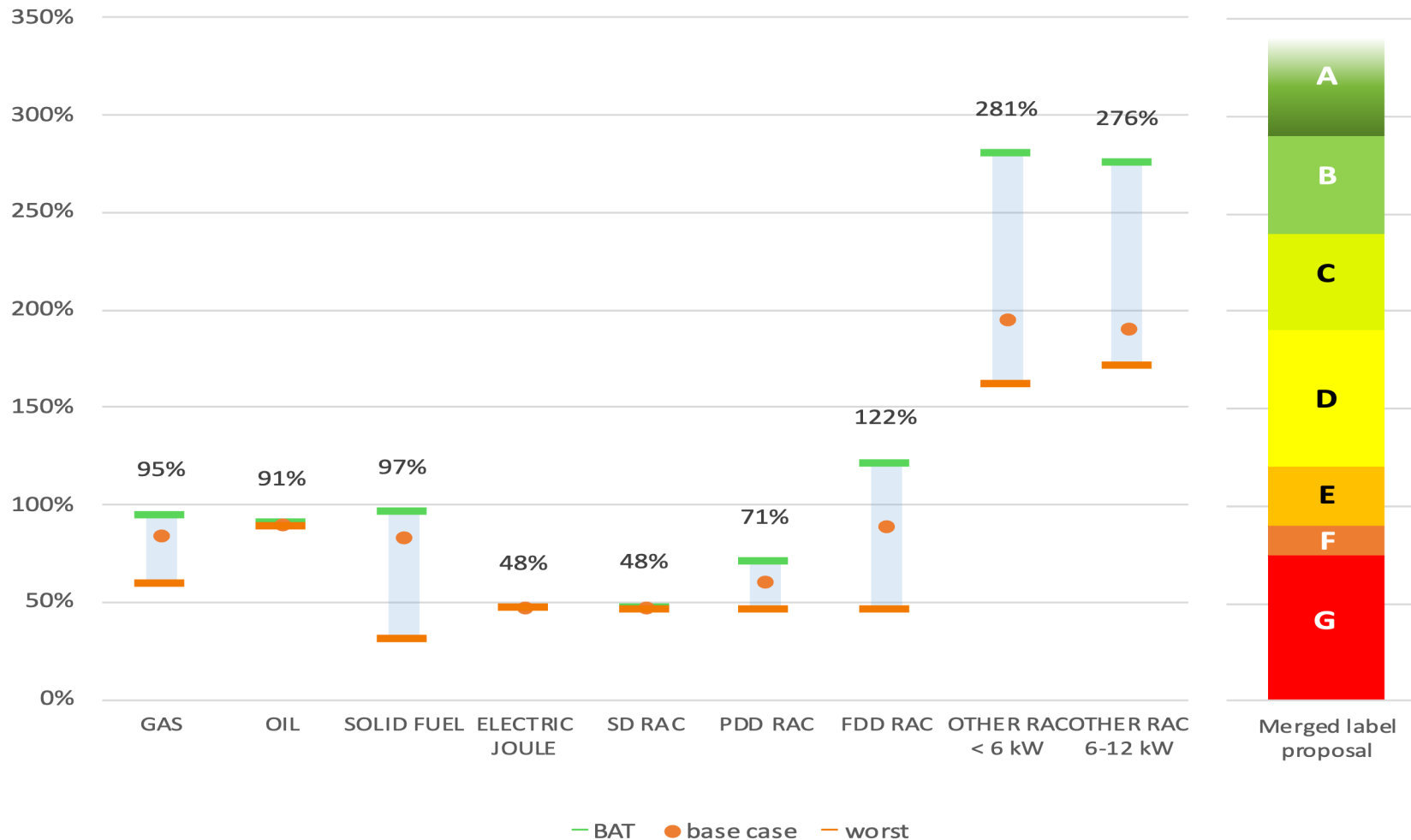
Standards & Labels programs - Benefits



In 2020 - Savings of ~7% of EU primary energy consumption, 170 Mt CO₂ equivalent GHG, 210 euros/household, 16 bcm of gas

Next? Local / room heating (direct heating)

MERGED ENERGY LABEL for HEATING RANGE average climate
based on data from EPREL, Review Study and IA for RAC and CF



NOW

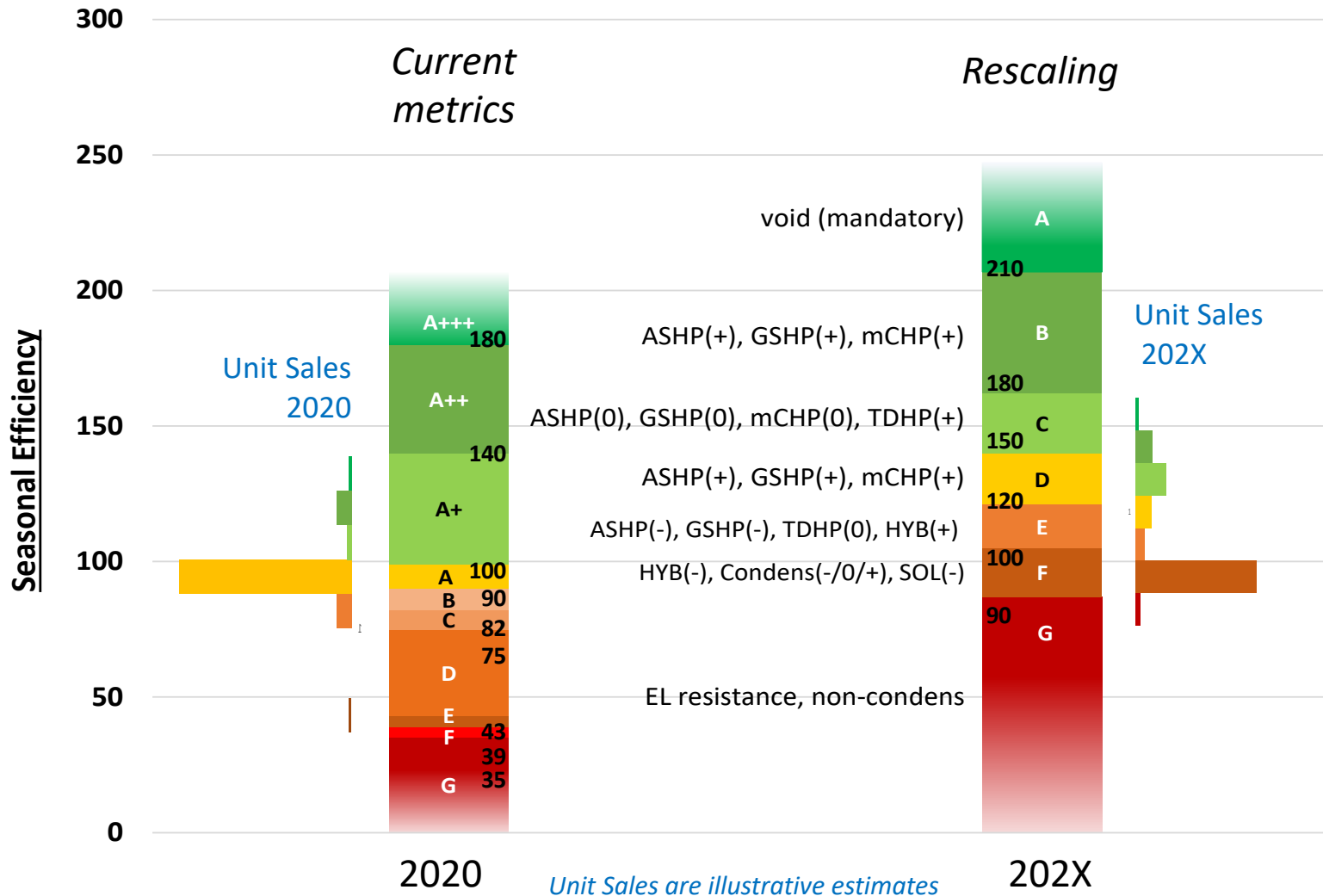
5 scales and electric heating not labelled

PROPOSED

Single scale for all products to favor substitution

Next? Hydronic space heaters (2021 review proposal)

EU Energy Label (@pef 2.1) proposal



Past efforts:

- 2015 MEPS to **remove non condensing** boilers
- About 50% EU stock condensing already in 2020

Next target ... all boilers! (2021)

- Rescaling mandatory
- Reorientate subsidies (article 7.2 2017/1369)
- Main alternative: heat pumps, either hybrid or stand-alone

REPowerEU (2022)

- MEPS 110% by 2029

Amongst the necessary conditions of success

- Increase people awareness on energy efficiency, H&C, heat pumps
- Enough skilled installers
- Economical conditions
 - ✓ Correct gas/elec taxation, carbon
 - ✓ Develop temporary/targetted subsidy or loan scheme
 - ✓ Need for a functioning Internal Market for HP cost to reduce with increased sales
- Articulation with other policies (e.g. EPBD) at national level
- Step up production (Green Deal Industrial plan)

➔ Need for follow- up and coordination of actions ➔

**EU action
plan on HP**

Thank you for your attention.

QUESTIONS?

Contact: Philippe.RIVIERE@ec.europa.eu

HEATING AND COOLING KNOWHOW AND SOLUTIONS



Supporting citizens willing to improve their heating and cooling comfort, including with low and no cost measures

HACKS Final Event – 14 February 2023



HACKS, an ambitious objective:

- *The objective of HACKS is to achieve market transformation for heating and cooling appliances by motivating consumers to replace old and inefficient equipment with new energy efficient equipment, and...*
- *...encourage **solutions** that consume less fuel, reduce energy bills and improve user comfort and health*



How to encourage solutions that **consume less fuel, reduce energy bills** and improve user **comfort and health**?



Beyond efficiency, sufficiency...

Energy **sufficiency** is meeting people's basic needs for energy services in a fair manner and within ecological limits.

A key concept to face winter 2022-23



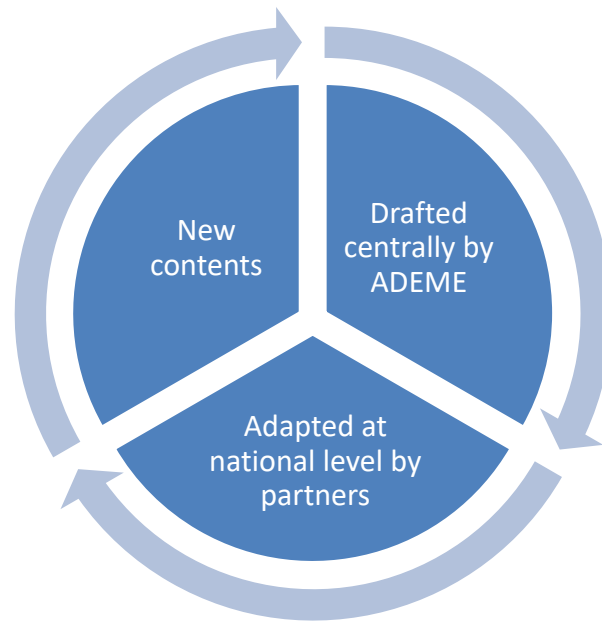
The role of the HACKS project

HACKS is a source of solutions to develop **energy sufficiency actions** to reduce energy demand by changing the quantity and quality of energy services required, but in a **sustainable way** and without falling below **people's basic needs**.



Catalogue of key information topics

Aim: identify and catalogue best practices on solutions for avoiding the excessive use of HAC equipment, for product purchase and use.



The result is a rich document containing a vast amount of useful advice

Catalogue of key information topics

Content:

- Topics on **comfort and air quality**: what determines comfort, main pollutants relating to heating and cooling (HAC) equipment, various solutions to live in a good indoor air quality.
- Topics helping to reduce the use of heating, hot water production and cooling. These cover **low cost and no cost solutions to save energy and save money** while improving comfort and indoor quality without investing in a new equipment.
- Advice to help citizens choose energy efficient HAC equipment when they need it.
- Tips on how to use these HAC equipment in an efficient way.



Catalogue of key information topics

Just two examples:

1.2.3.1. How to use mechanical ventilation

- If there is a controlled mechanical ventilation, **it should not be switched off** as it is designed to operate continuously. Its speed is adjustable: turn on the maximum flow when cooking or taking a shower, for example.
- It is essential to **regularly check the correct operation of mechanical ventilation**.
 - Once every three months, **clean the extract and blower vents**: unclip the removable and washable part and reposition it after cleaning. Caution: do not wet the fixed parts of the humidity sensitive air inlets, this would impair their correct operation.
 - Have the maintenance of your mechanical ventilation carried out every three years by a specialist.
 - For heat recovery ventilation, change the insufflation and extraction filters: once or twice a year according to the zones, including at least once after the pollen season.
- In order to check if the mechanical ventilation works properly, (while holding it to avoid it is sucked-in) place a sheet of toilet paper in front of the air extraction mouth in the kitchen, bathroom, toilet: it should be drawn towards the mouth.

1.2.3.2. How to evacuate excessive moisture

- **Maintain a humidity level between 35 and 60% and a temperature between 18 and 22°C**. If necessary, use a hygrometer (humidity tester) to measure the humidity level of a wall or room.
- **Ventilate** during and after activities that produce a lot of humidity (bathing, showering, laundry, cooking, etc.).
- Put a **lid on pots** and pans when cooking and activate the extractor hood.
- **Dry clothes outside** or in a well-ventilated room.
If these actions are already implemented but the home remains damp, the ventilation system should be reviewed and the cause should be investigated: the indoor air is certainly not being renewed enough.
- **If mould appears** on walls or ceilings, the home is too damp. Do not allow mould to grow, it is harmful to the health. **Clean them** as soon as they appear and look for the cause (e.g. water leaks, capillarity, infiltration, etc.).

2.2.3. Heating - Solutions relating to users' behaviour

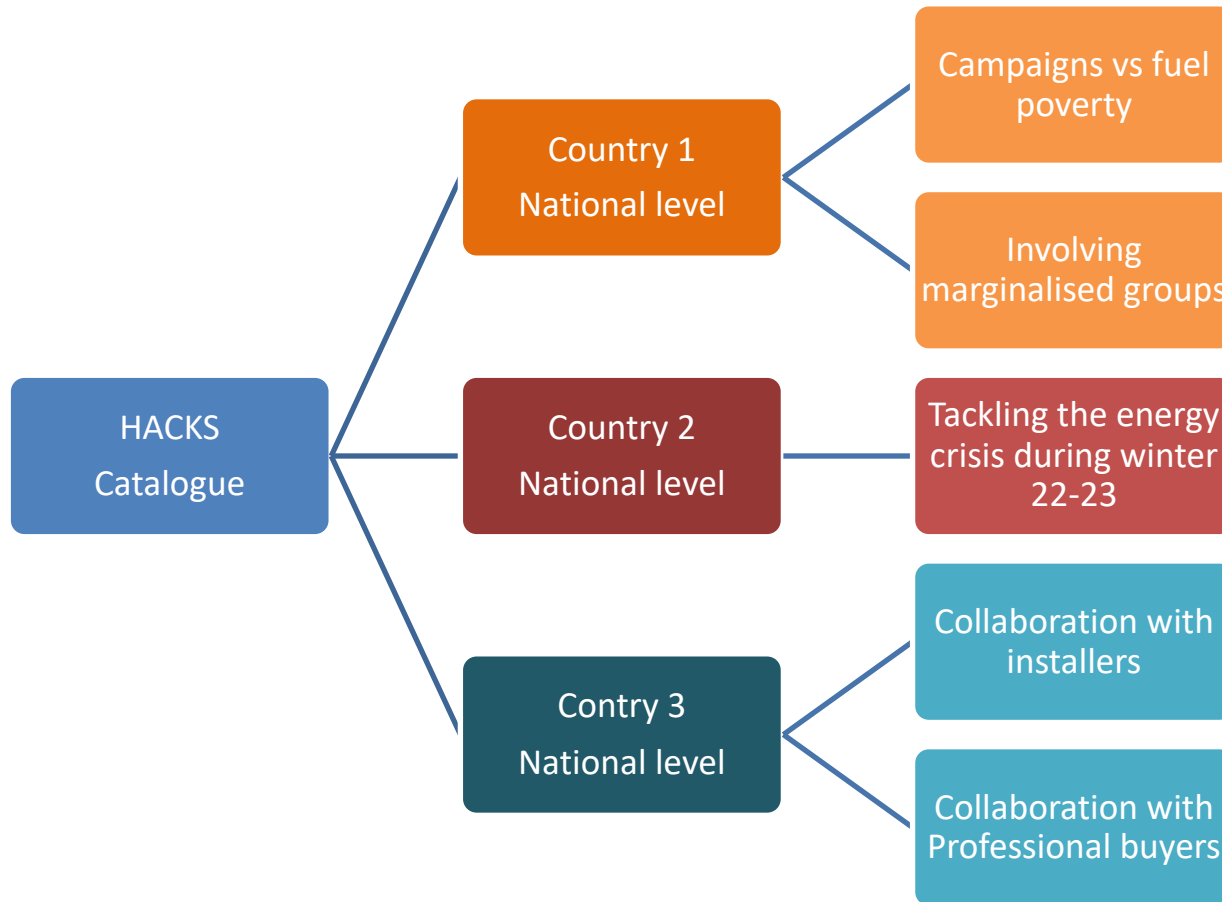
2.2.3.1. Heating - Adopting good habits with windows

- When improving the airtightness of windows, or when replacing them, it is important to **check whether there is a functioning mechanical ventilation system**. It is essential for healthy air in the home.
- **Maintain and caulk windows**: To limit air infiltration, check the condition of the doors and windows and, if necessary, reseal them (sealant, gaskets, etc.).
- **Use shutters and curtains**: Doors and windows, even of good quality, are weak points in the insulation of a house. Using shutters and curtains reduces the feeling of cold walls.
- Generic advice to **use windows depending on their orientation** in the winter:
 - Windows turning North: drop down or close the blinds (or other shadow system) in the afternoon to avoid thermal losses.
 - Windows turning East: rise up the blinds (or other shadow system) during the morning, it is possible to open the windows for air ventilation.
 - Windows turning South: keep the blinds (or other shadow system) open as long as there is sun and closed after.
 - Windows turning West: open the blinds (or other shadow system) during the afternoon, it is possible to open the windows for air ventilation.

2.2.3.2. Adopting good habits with temperature setting

- **Lower the temperature** and adapt clothing: e.g. in France setting the thermostat one-degree lower leads to 5% to 7% savings on the energy bill.
- Set the thermostat according to **national / local prescription** e.g. in France 19°C in winter.
- Adopt **different temperatures according to uses and times of the day**:
 - Different temperatures in the living room, the bedroom, use of possible buffer zones.

From words to deeds



Videos
Infographics
News
Events
Webinars
Pro guidelines
Etc.

Klimaschonend DURCH DIE Heizsaison

Mit diesen einfachen Tipps verwenden Sie in der kalten Jahreszeit weniger Energie und sparen Geld. Gleichzeitig erhöhen Sie Ihren Wohnkomfort und schützen das Klima, denn es gilt: Jede nicht verbrauchte Kilowattstunde ist eine klimafreundliche Kilowattstunde.

Jährliche Einsparung*


	Gluckernde Heizkörper? Zeit zum Entlüften! Mit einem Entlüftungsschlüssel können Sie die Luft einfach selbst aus dem heißen Heizkörper ablassen.	65€ 18 (230 kg _{CO₂})
	Die Temperatur macht's Die Raumtemperatur sollte nicht höher als nötig sein. Grundsätzlich gilt: Ein Grad weniger spart etwa sechs Prozent Heizenergie.	75€ 20 (255 kg _{CO₂})
	Richtig lüften Bei dauerhaft gekippten Fenster kühlen die Wände aus. Lieber nur ein paar Minuten stoßlüften, dann muss der Raum nicht von Grund auf neu aufgeheizt werden.	155€ 40 (500 kg _{CO₂})
	Fenster abdichten Passende Dichtungsbänder aus dem Baumarkt verhindern den Wärmeverlust durch undichte Fenster. Tipp: Verwenden Sie ein Teelicht oder Räucherstäbchen, um undichte Fenster zu finden.	65€ 18 (230 kg _{CO₂})
	Vorhänge und Jalousien nachts schließen Halten Sie Vorhänge, Jalousien und Rollos nachts geschlossen und senken Sie so den Wärmeverlust über die Fenster. Achtung: Tagsüber sollen Heizkörper jedoch nicht von Vorhängen oder Möbeln verdeckt sein.	15€ 4 (50 kg _{CO₂})

*Jährliche Kostenersparung eines 3-Personenhaushalts (110 m² Einfamilienhaus, Gashheizung). Jährliche CO₂-Einsparung in Abhängigkeit CO₂-Einsparung (Brennstoffe unberücksichtigt).



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Guias Topten para a eficiência energética na contratação

Bombas de calor

Atualizado em: Fevereiro 2022



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1. O que é o Topten?

O Topten.pt Pro (<https://topten.pt/business>) é um portal criado para ajudar os consumidores, profissionais, entidades públicas adjudicantes e outros grandes compradores a encontrar e adquirir produtos energeticamente mais eficientes disponíveis no mercado português.

Nas informações de apoio encontram-se um conjunto de guias para a eficiência energética na contratação pública dedicados a vários tipos de produtos. Têm como objetivo orientar as entidades públicas e privadas a fazer procedimentos de contratação que levem à aquisição de produtos eficientes do ponto de vista energético. Nestes guias são propostos critérios Topten- de eficiência energética, explicando-se de que forma podem ser inseridos nos documentos de concurso.

Na página principal Topten.pt encontra um menu de categorias que disponibiliza uma listagem independente e atualizada regularmente de produtos selecionados que têm um elevado desempenho ambiental e energético e que cumprem os critérios de eficiência energética dos guias Topten. As entidades contratantes podem consultar o portal e verificar quais os produtos no mercado nacional que satisfazem os critérios Topten e que são mais eficientes do ponto de vista energético.

O Topten.pt Pro foi desenvolvido no âmbito do Topten Act, com financiamento da União Europeia, ao abrigo do programa H2020.





Actualidad Quienes Somos

Cocinar Lavar Conservar Electrónica Iluminación Climatización

Televisores

Aire acondicionado

Lavavajillas



Noticias



¿Cómo afectan los sistemas de calefacción a nuestra salud?

Apostar por la sustitución de sistemas de calefacción basados en combustibles fósiles por alternativas como las bombas de calor o paneles solares y solares-térmicos y un enfoque holístico que favorezca sinergias con otras transiciones que ya han comenzado - rehabilitación profunda de edificios, electricidad 100% renovable, autoconsumo- es fundamental .>> [keep reading](#)



¿Cómo purgar radiadores? ¡Tú mismo lo puedes hacer!

Lo primero que debes saber es que, como regla general, los radiadores se deben purgar al menos una vez al año, idealmente durante el otoño y previo a las temperaturas...>> [keep reading](#)



Nuestros hábitos diarios y la eficiencia energética de nuestros sistemas de calefacción: dos factores determinantes a la hora de ahorrar en nuestras facturas eléctricas.

Las bajas temperaturas del invierno se aproximan y no solo debemos sacar poco a poco nuestros abrigos, sino que vamos revisando nuestros sistemas de calefacción para asegurarnos que podemos hacer...>> [keep reading](#)





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Coffee Break

Join back at 15h40!

