Thermally Driven Heat Pumps
La soluzione per il retrofit sostenibile

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@ Regione Lombardia - Milano

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ARISTON GROUP

D&P SOLUZIONI AVANZATE PER L'INGEGNERIA

GEFRAN BEYOND TECHNOLOGY

POLITECNICO MILANO 1863

SINTEA

snam

Thermally Driven Heat Pumps

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i-gap

REALIZZATO CON IL SOSTEGNO DI

UNIONE EUROPEA
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POR FESR 2014-2020 / INNOVAZIONE E COMPETITIVITÀ

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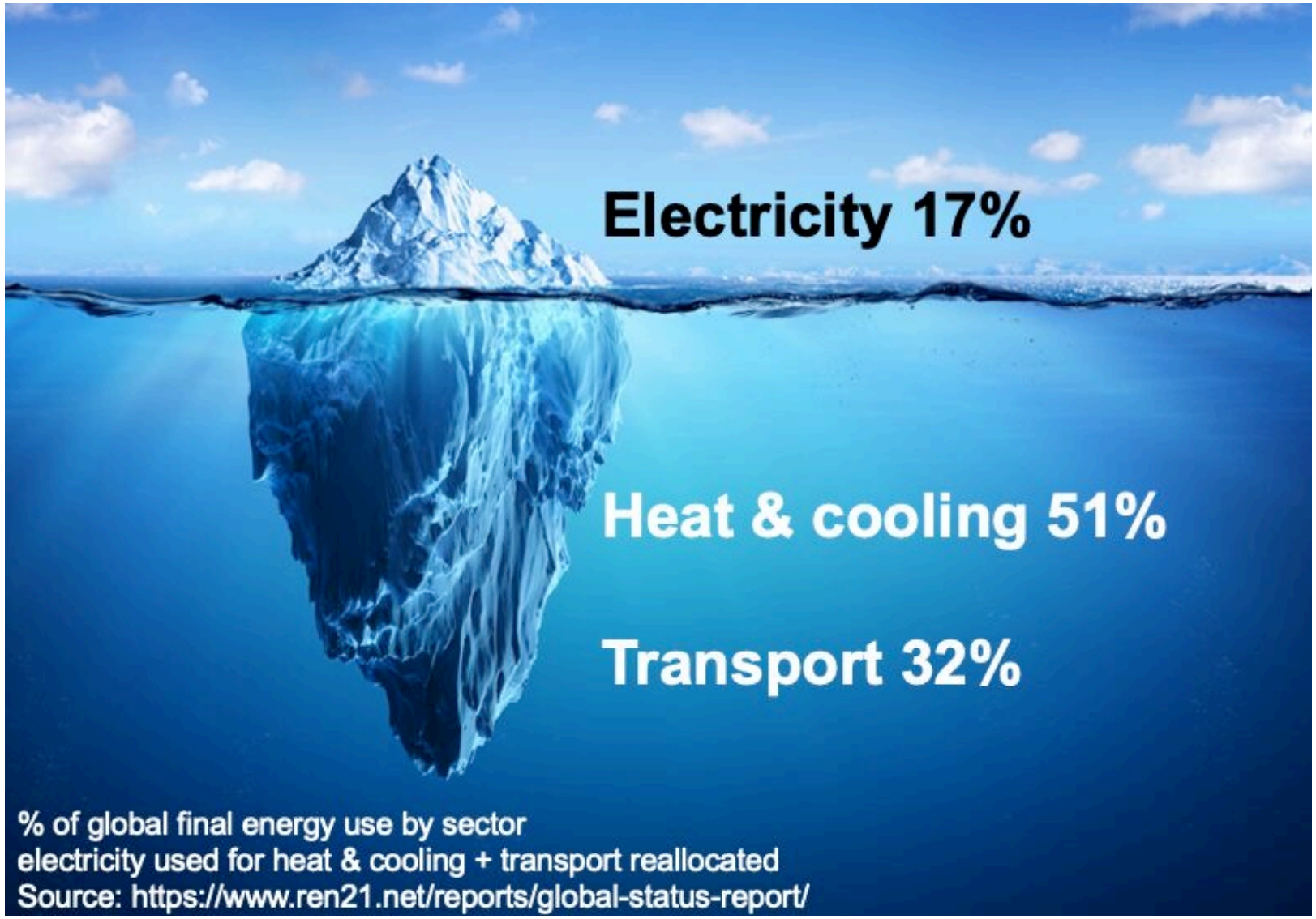
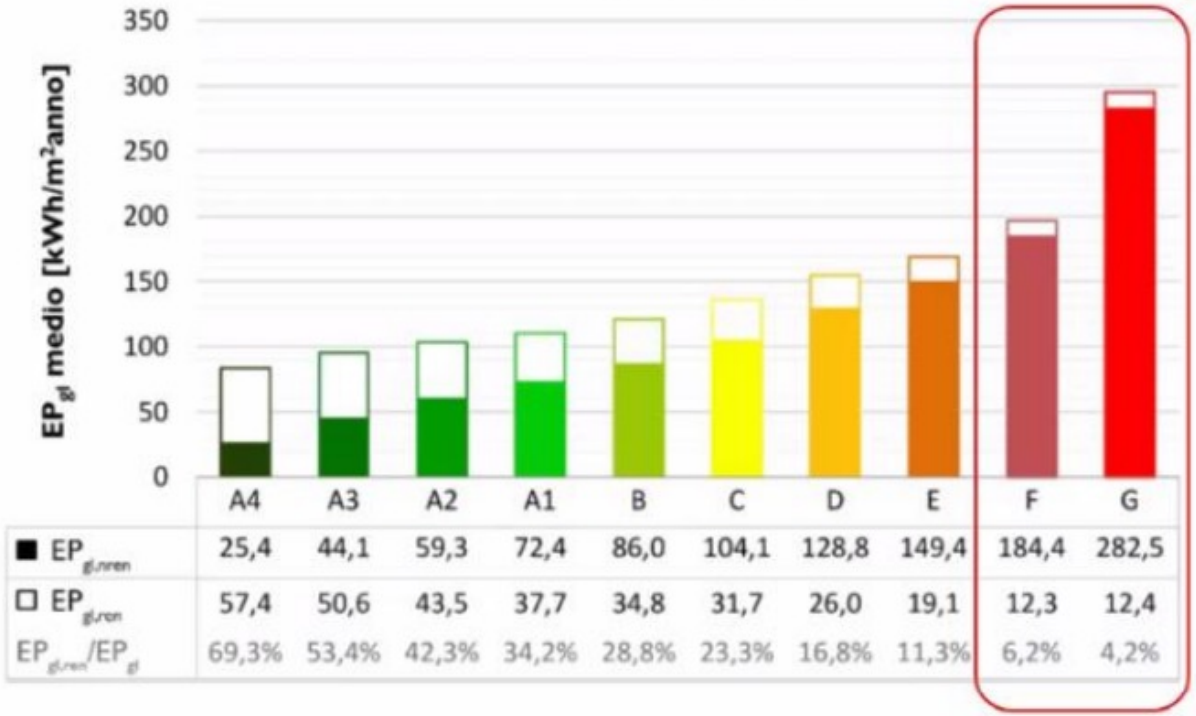
Transizione Energetica



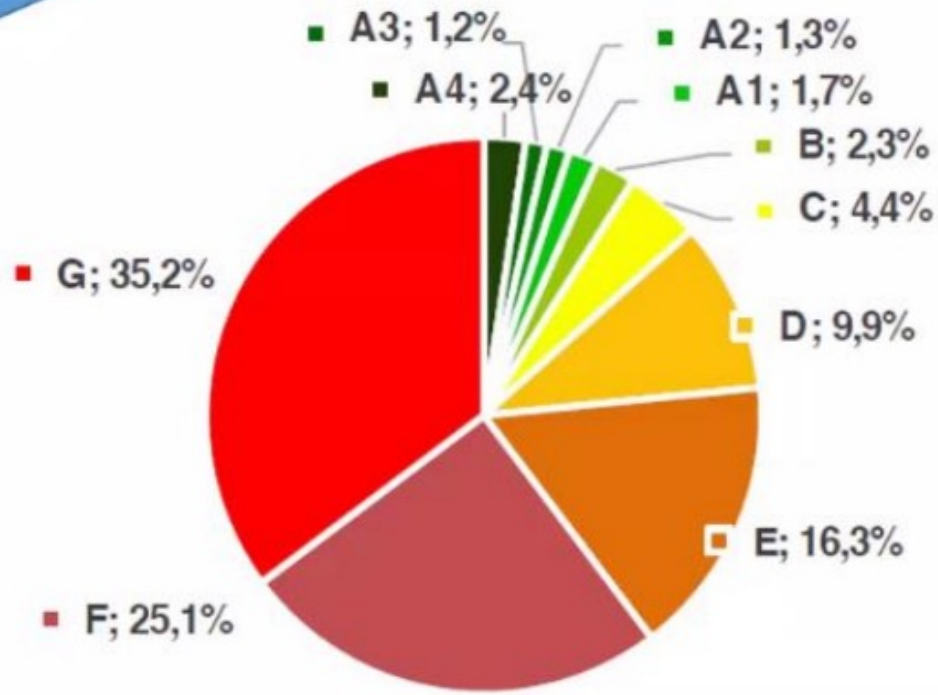
Stato edifici: parco immobiliare italiano

Fonte: ENEA, Rapporto annuale sulla certificazione energetica degli edifici, 2021



	A4	A3	A2	A1	B	C	D	E	F	G
■ $EP_{gl,ren}$	25,4	44,1	59,3	72,4	86,0	104,1	128,8	149,4	184,4	282,5
□ $EP_{gl,ren}$	57,4	50,6	43,5	37,7	34,8	31,7	26,0	19,1	12,3	12,4
$EP_{gl,ren}/EP_{gl}$	69,3%	53,4%	42,3%	34,2%	28,8%	23,3%	16,8%	11,3%	6,2%	4,2%

Indici di prestazione energetica globale dell'edificio espresso in energia non rinnovabile e rinnovabile. Settore residenziale, 2020



Distribuzione degli edifici per classe energetica. Settore residenziale, 2020.

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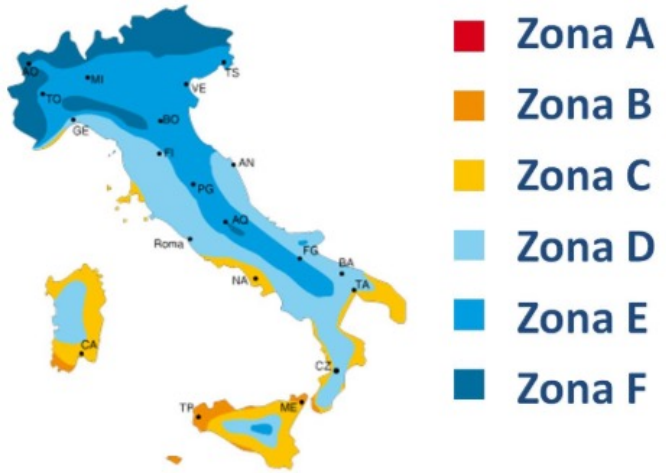
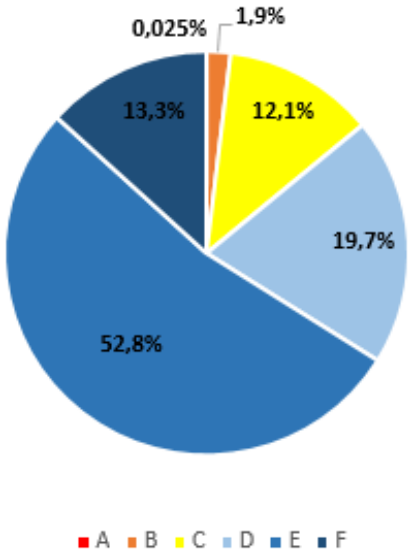
Distribuzione della popolazione

Number of cities for Climate Zone

A	2
B	153
C	981
D	1607
E	4272
F	1073
Tot.	8088





Average Project Temperature per Climate Zones [°C]

A	>5
B	4
C	0
D	-1
E	-6
F	-13

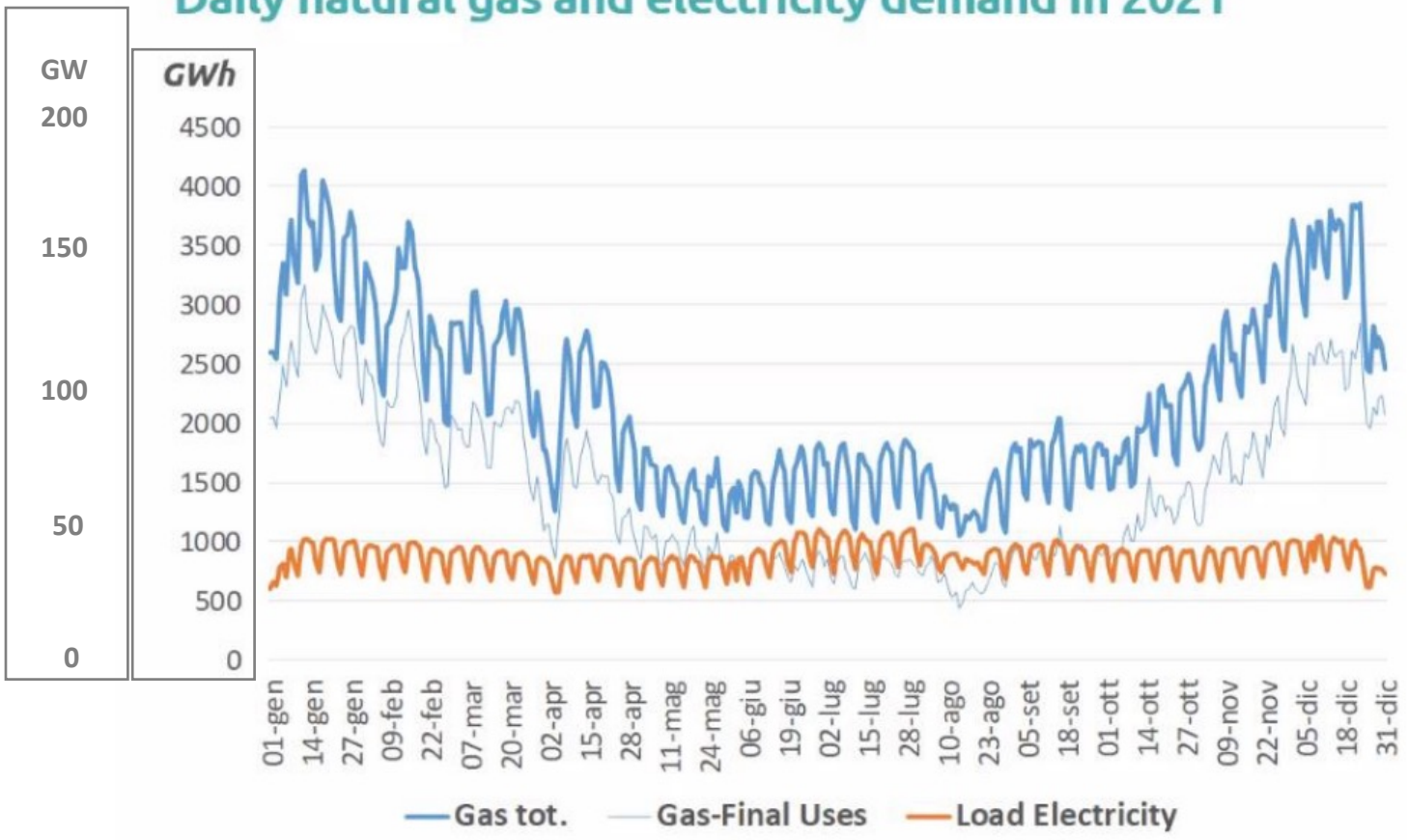
More than **66%** of Italian cities are in **E** and **F** Climate Zone:

- 52,8% in E with an average Temp. project of **-6°C**
- 13,3% in F with an average Temp. project of **-13°C**

Infrastruttura energetica
(esempio Italia)

Italian daily demand in 2021: natural gas vs electricity

Daily natural gas and electricity demand in 2021



Total gas demand	806 TWh (76,4bcm)
Gas demand in final uses	531 TWh (50,2 bcm)
Electricity demand	318 TWh

snam energia per ispirare il mondo

Picture courtesy of SNAM

Conclusions about drivers

The **largest heating market** in Europe is the **retrofit segment**, where low-efficiency heating systems are installed. **Renovating and upgrading** this building stock to a lower energy consumption profile will be one of the **biggest challenges of the coming years**.

Current solutions based on electric heat pumps might not be sufficient to completely fulfill this task.

Thermally Driven Heat Pumps are one of the few solutions which can guarantee **high efficiency** and **high power even in high-temperature applications**.

It can be considered as the **ultimate hybrid solution** by natively and intimately integrating the combustion technology with the heat pump thermodynamic cycle

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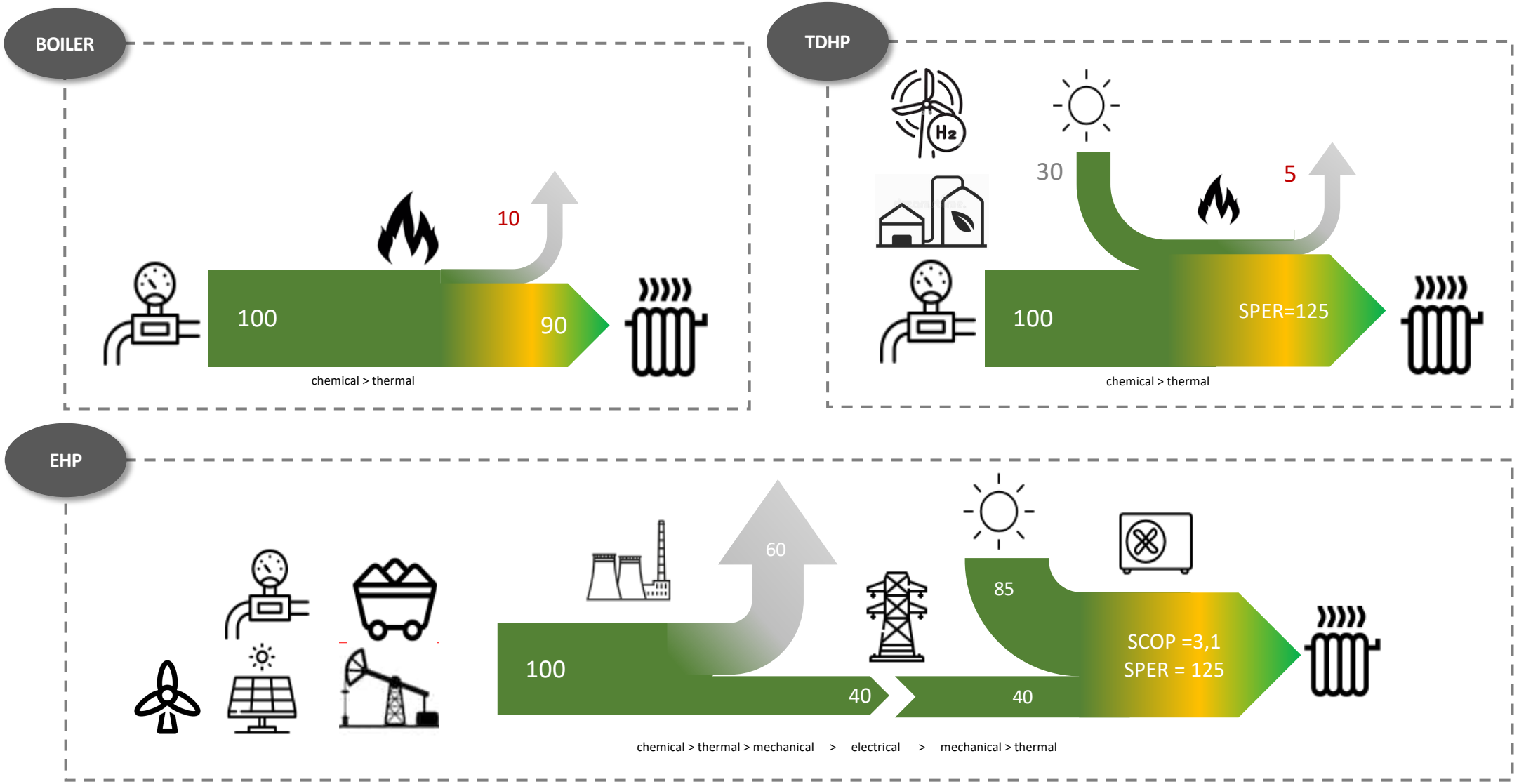
Energia rinnovabile ed Energia primaria

(today: Nat Gas, LPG and H2 blend 20%) in future 100%H2)



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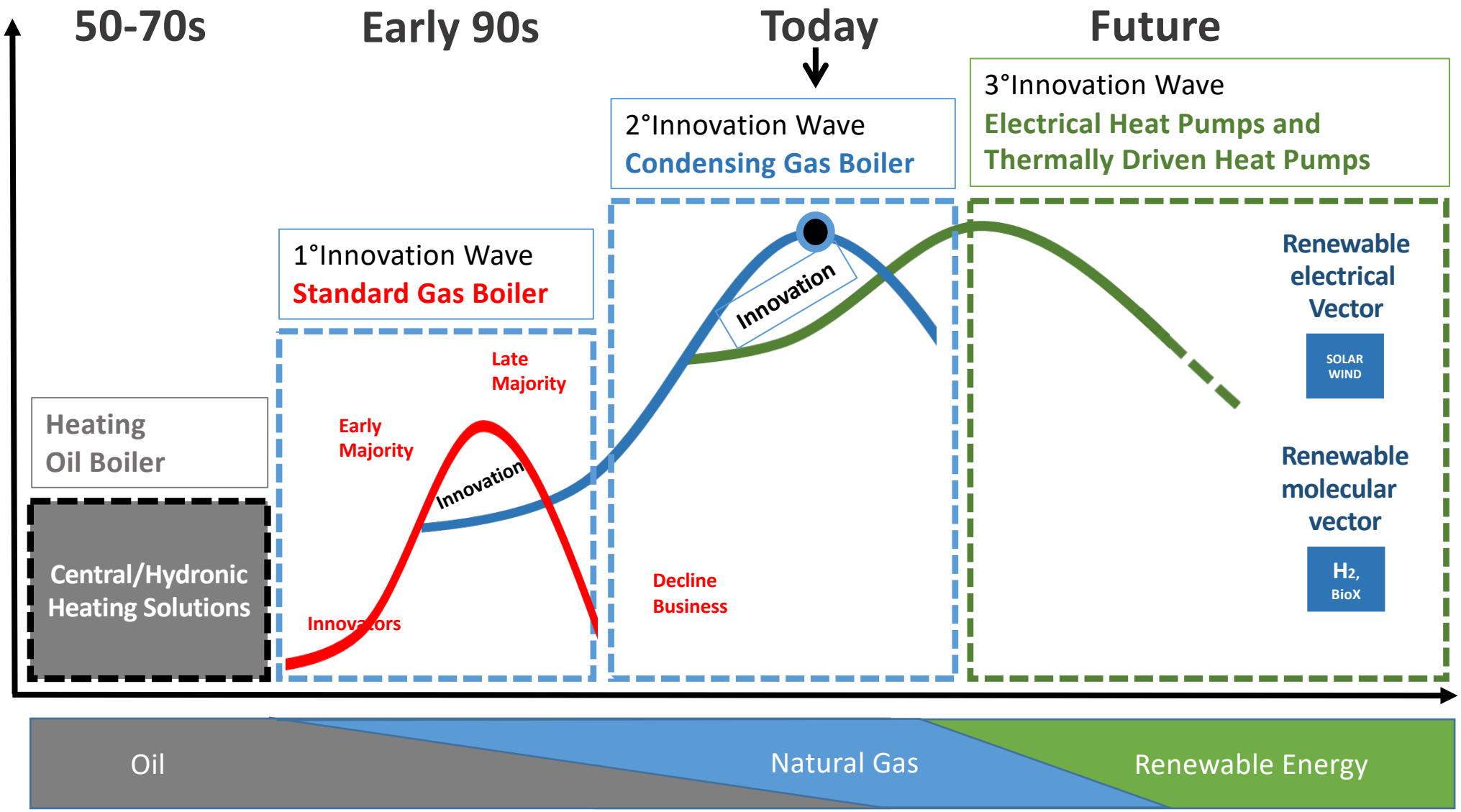
Innovazione tecnologica

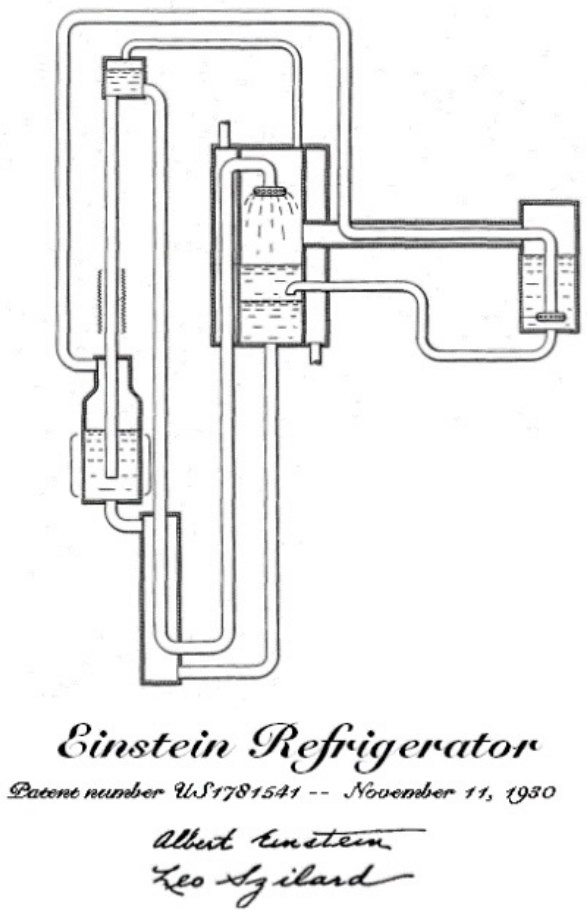


Lombhe@t: Ricerca per consentire prodotti reali

ARISTON ELOGOS (IT, FR)
10kW

ELCO THALION (DE, CH)
ATAG THERMION (NL)
15kW

Lombhe@t: risultati ottenuti



Vantaggi resi disponibili:

- Utilizzo del Principio “**Pompa di Calore**”
- Utilizzo di **Energia Rinnovabile**
- **Efficienza energetica** anche con radiatori
- **Potenza termica** anche con radiatori
- **Ridotti costi** di esercizio (-30-40%)
- **Affidabilità** (assenza di parti in movimento)
- Funzionamento **silenzioso** (assenza di compressore e ridotto flusso dell’aria)
- Basse **emissioni** (CO2, NOx, PMs, F-GAS)
- Compatibile con evoluzione dei **green gases** (BioMetano, Bio-GPL, H2 Blend e H2 100%)

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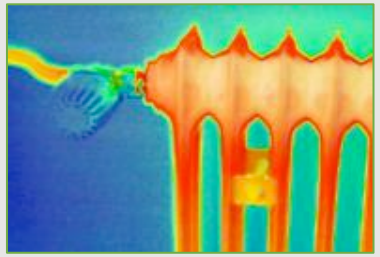
Lombhe@t:
innovazione tecnologica per la decarbonizzazione



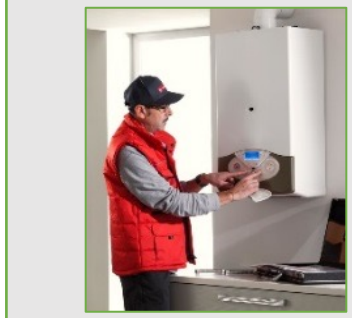
Easy retrofit solution for customers

High efficient solution that lowers bills for customers.

Simultaneously low operating costs and low emissions

Use of renewable energy while reducing gas consumption and dependency.
Enabling green hydrogen potential

TDHPs on hydrogen maximize the efficient use of gas grid to heat more buildings



Suitable for existing “Gas Service” organizations

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Grazie

More info about TDHP technology and TDHP products on:

www.theheatingsolution.com

https://www.ehpa.org/publications/report-thermally-driven-heat-pump-technology/