



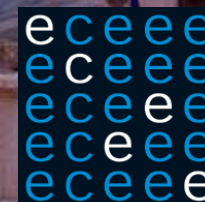
# Energy sufficiency & efficiency

Two sides of the same room?

The viewpoint of an energy and service utility

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# How to differentiate between sufficiency and efficiency

● Sufficiency (energy needs = energy service, e.g. kWh, m<sup>2</sup>, km) → **extensive variable?**

- Daily behaviour (e.g. decreasing set-temperature...)
- Investment choice (less is more? reduction of energy service)
- Behaviour (e.g. under-optimization: e.g. opening windows in winter w/ space heating...)

● Efficiency (performance, e.g. ; kWh/m<sup>2</sup>) → **intensive variable?**

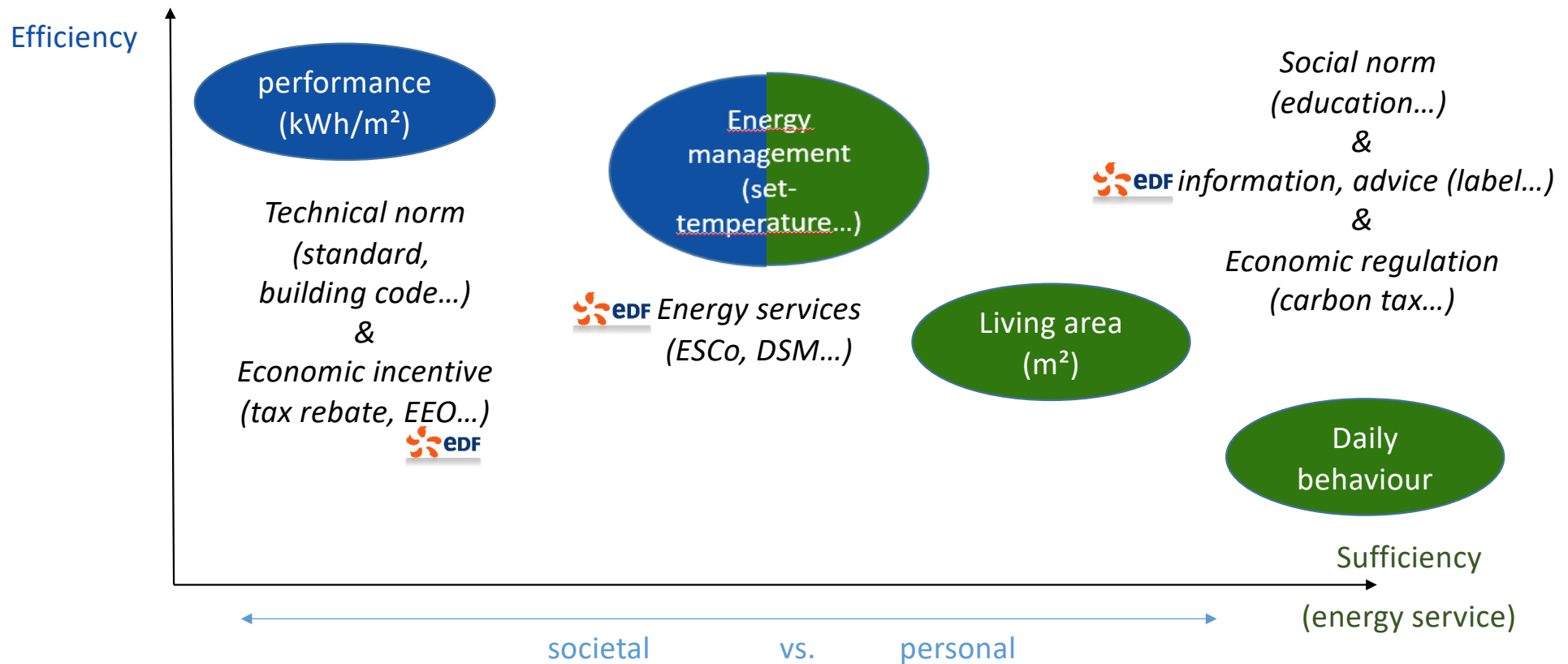
- Oriented investment choice (financial incentive) & constrained choice (MEPS)

information  
incentive  
constraint

→ Questioning:

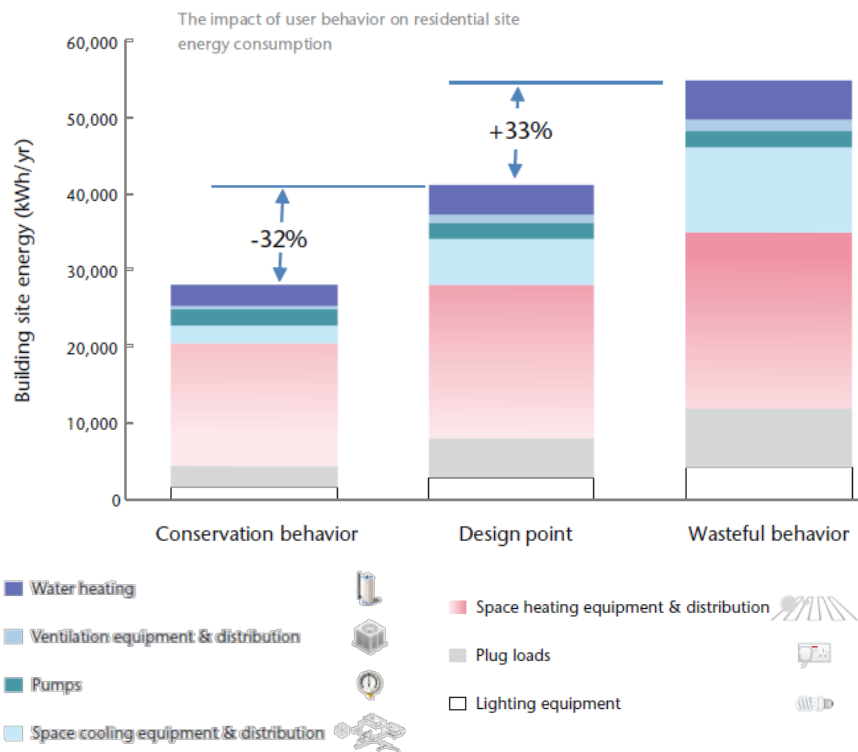
- to differentiate sufficiency (sobriety) and energy service
- The place of energy management

# A schematic presentation: a proposal



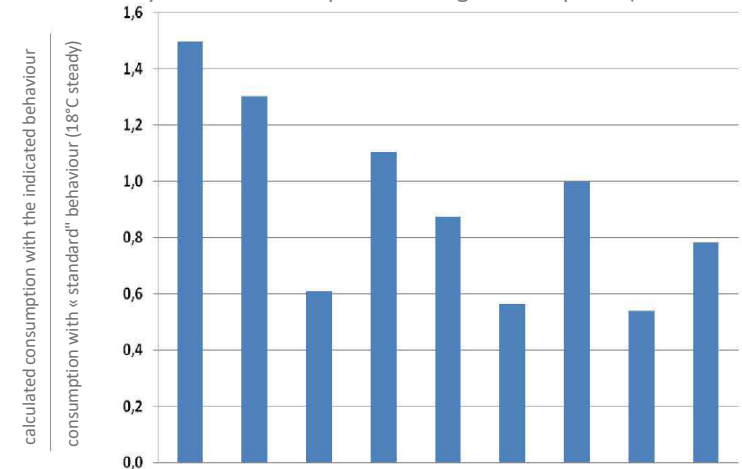
# Behaviour: an important lever to sobriety?

- How to limit the spread within values?
- Conventional consumption (19°C) vs. actual?



Source: WBCSD

Influence of daily behaviour on space heating consumption (worst case)



Set-temperature (°C)  
night-time temperature drop (-3°C)  
temperature drop when leaving (-3°C)  
Night turn off  
switch off when leaving  
lower the air change (-50%)

	23	21	21	19	19	19	18	18	16
					X				
					X				
			X			X		X	
			X			X		X	
			X			X		X	

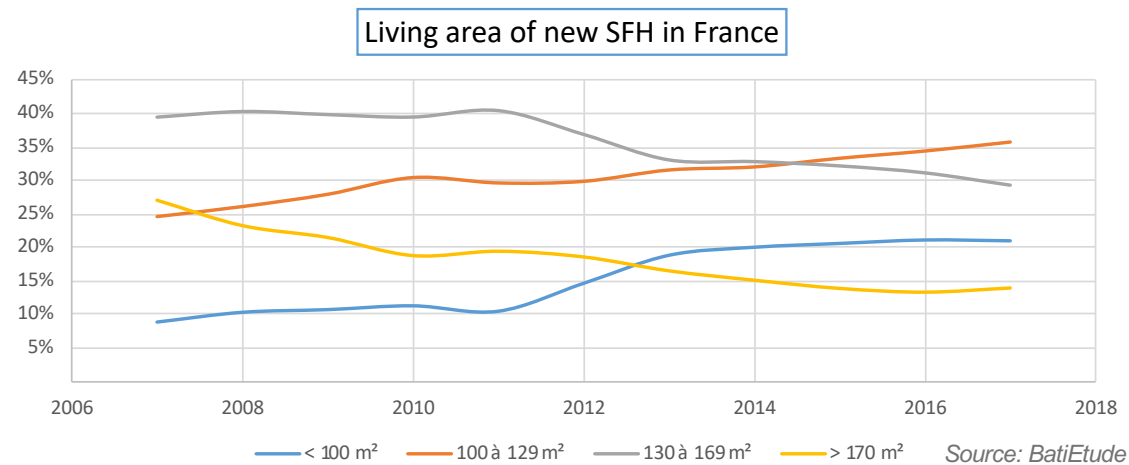
Source: EDF



Sufficiency → lowering of individual energy service  
Energy management → no individual energy service

# Economic constraints/signals → sufficiency?

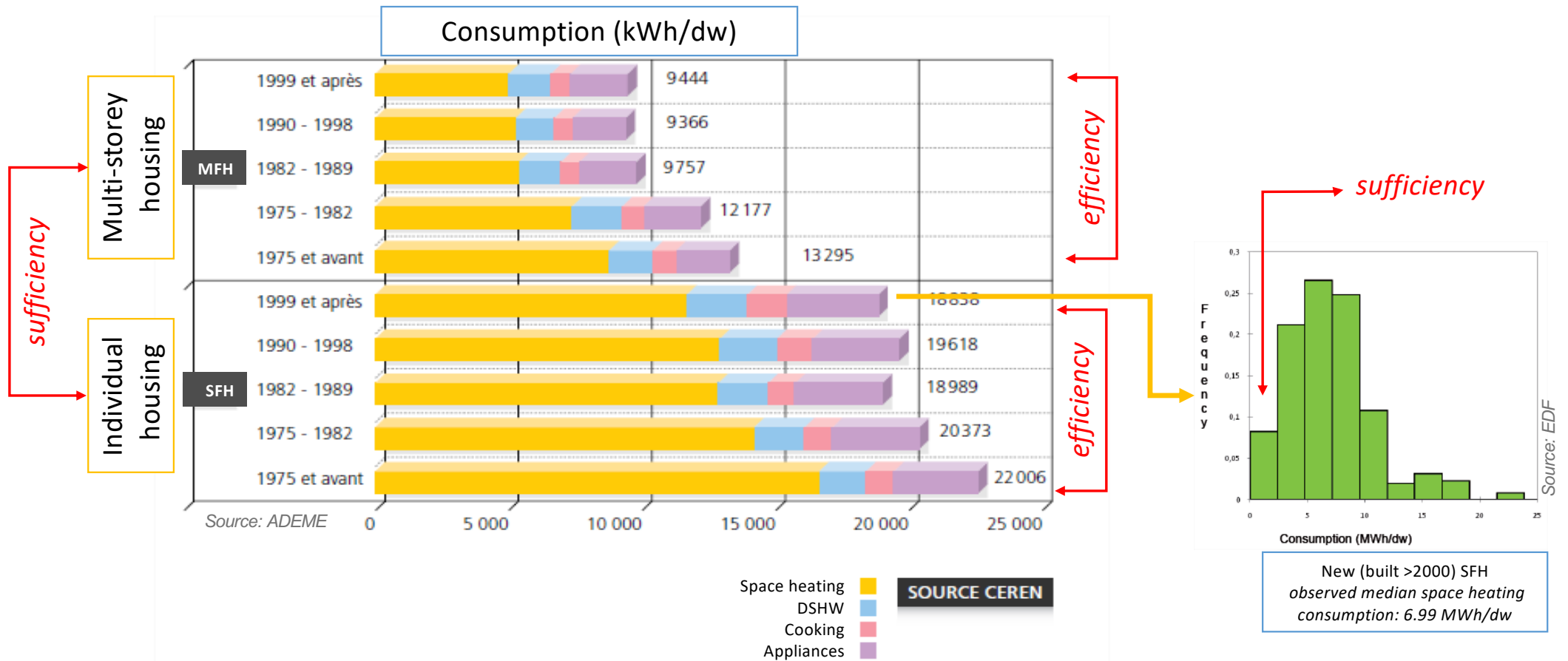
- Chosen or imposed sufficiency?
- Effect of an indirect price signal?



Additional cost of regulation (RT2012 +10% vs. RT2005\*)  
+ economic crisis  
→ surface reduction?

\*Source: CGDD

# Dwelling consumption in building: a blend of societal and personal choice



# Conclusion: from factor 4 to carbon neutral

