

Strategic policy packages to deliver energy efficiency in buildings – theoretical analysis and international evidence

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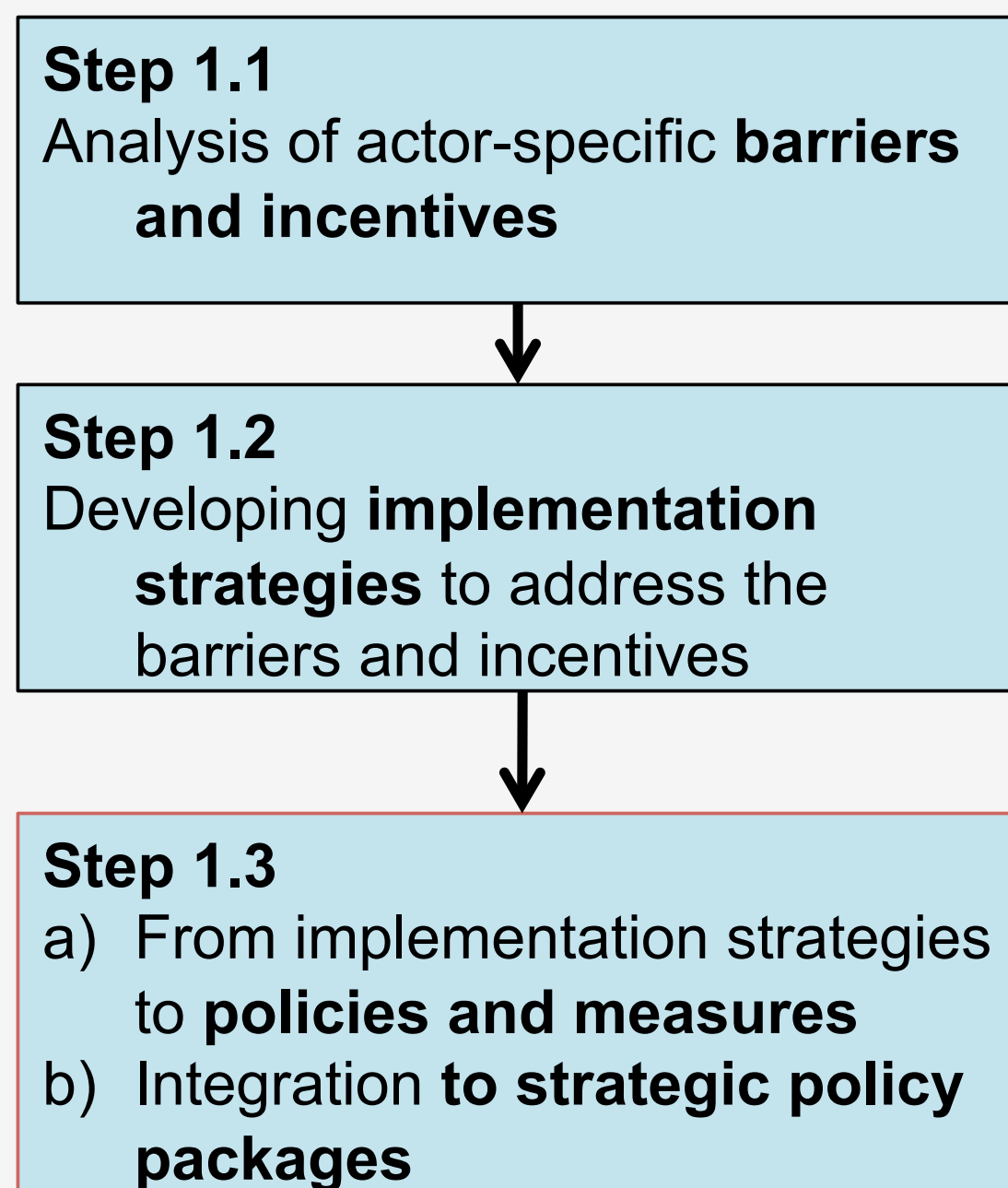
Research objective and approach

Energy efficiency in buildings and appliances has the potential to halve the energy consumption and greenhouse gas emissions from that sector by 2050, despite growth in building and appliance stock. However, this potential will not become reality without policy support, due to complex market chains and a plethora of barriers. What are, then, effective packages of policies and measures to stimulate energy efficiency in new and existing buildings, and appliances? In recent research, we have addressed the question in a systematic way – by combining theoretical evidence on what policy support markets need, and an international comparison on which packages of policies have worked well.

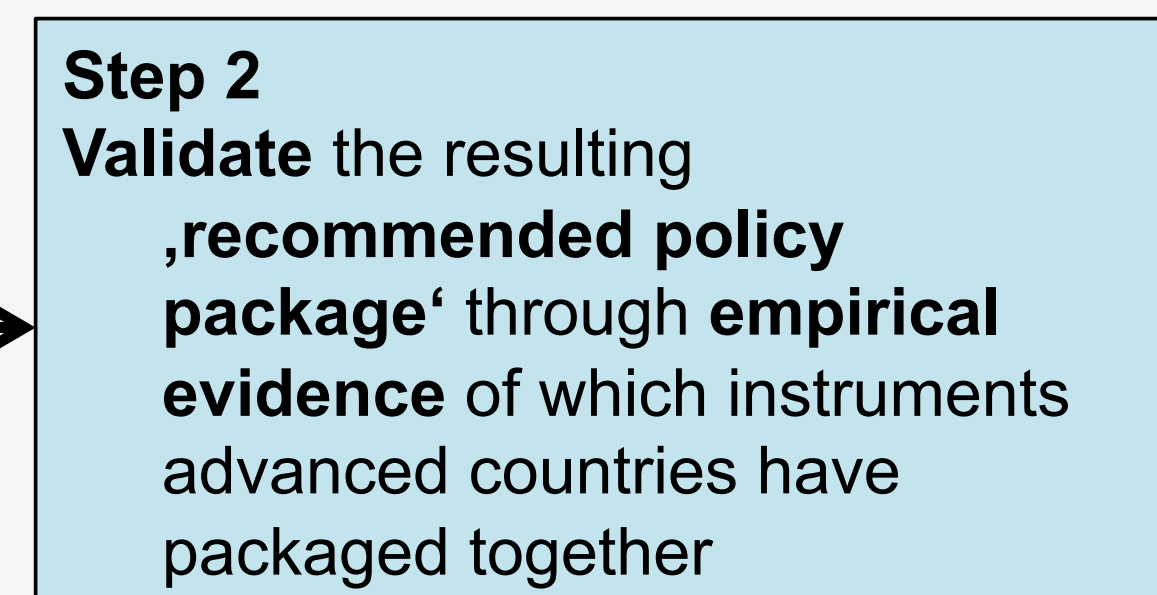
On the theoretical side, the analysis starts with the barriers but also market-inherent incentives that the different types of market participants face. This enables to derive a recommended package combining the types of regulatory, economic and other policies and measures the actors need to overcome all these barriers and strengthen incentives. On the empirical side, evidence has been collected and their design and impact compared, to check if advanced countries have indeed used the combination of policies we derived from the actor-centred analysis. Finally, the model examples are used to validate the generic policy package identified in the theoretical analysis.

Methodology

The actor-oriented theoretical analysis



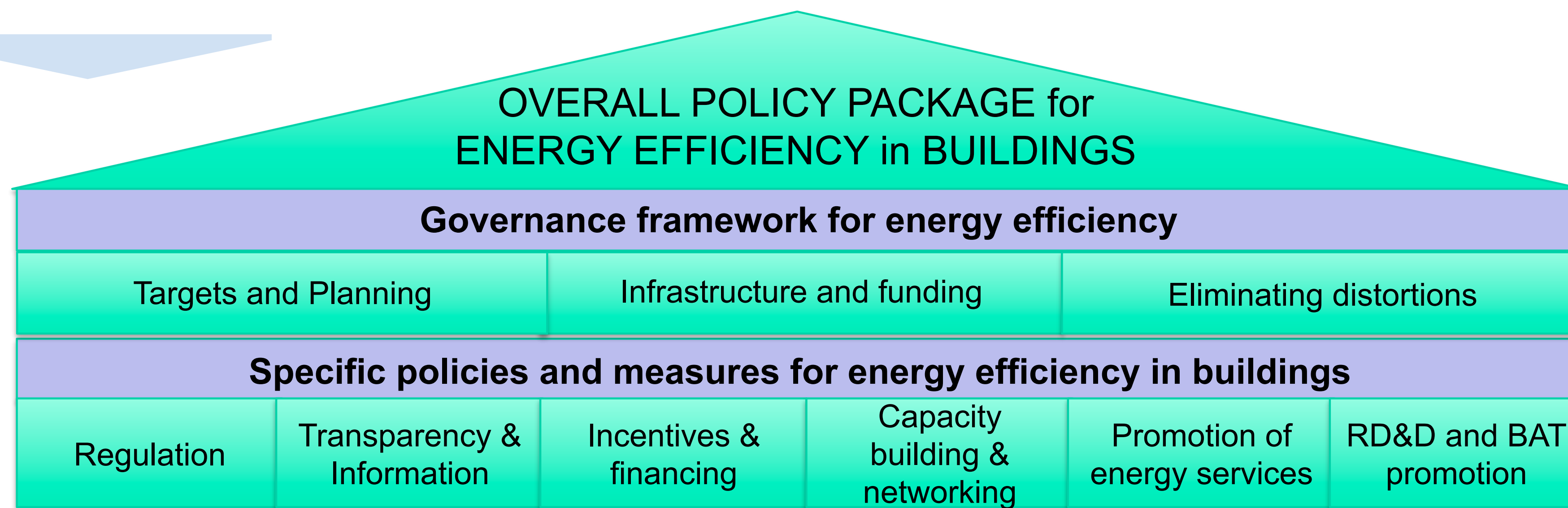
The empirical proof



Empirical proof

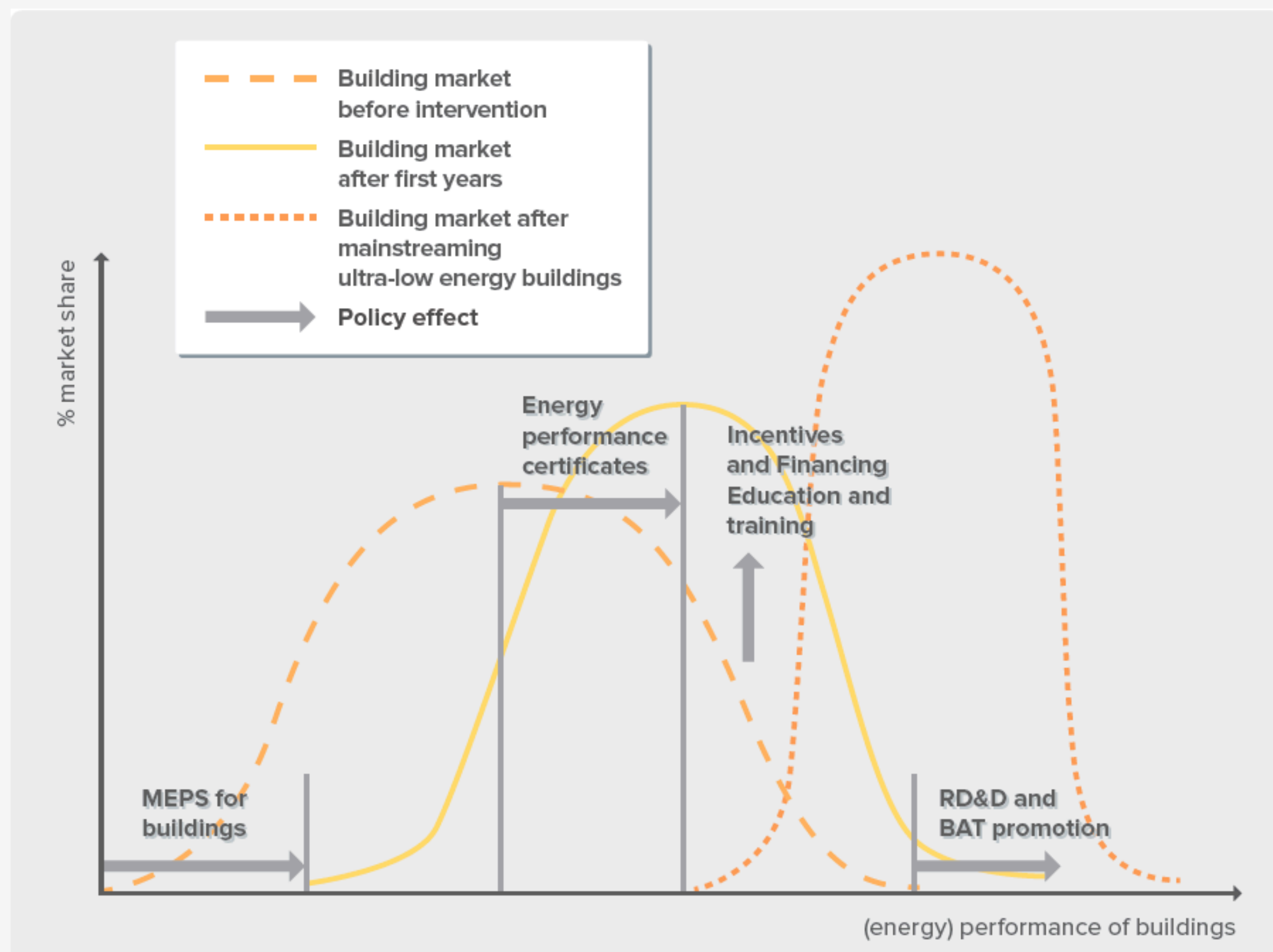
As advanced countries show, the policy package that we derived from our actor-centred analysis **comes close** to policies countries have combined to approach very high levels of energy efficiency.

Policy	California	China	Denmark	Germany	Tunisia
Targets	x	x	x	x	x
Energy Agency	(x)	(x)	x	x	x
Funds or DSM	x DSM	(x)	x DSM	(x)	x Funds
MEPS/codes	x	x	x	x	x
EP Certificates	(x) volunt.	(x) vol.	x	x	x
Advice/audits	x	x	x	x	x
Grants	x	(x)	x	(x)	(x)
Soft loans/PAYS	x			x	x
Training	x	x	x	x	x

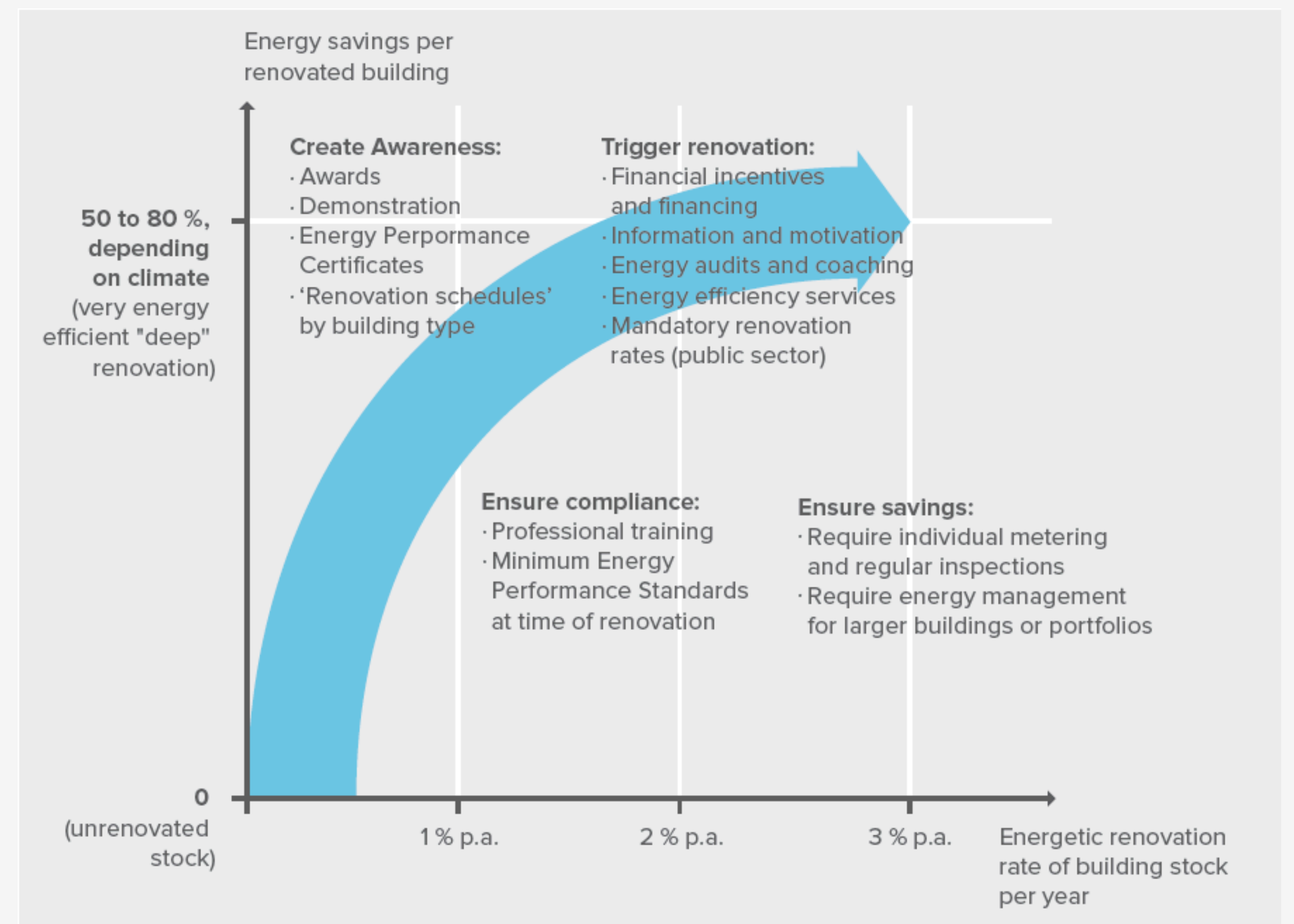


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Specific policies for energy efficiency in new buildings



Specific policies for energy efficiency in existing buildings



Conclusion

The recommendable policy package for **new buildings** is similar to the well-known one for appliances, but with the objective to mainstream nearly zero energy buildings.

By contrast, the task for **existing buildings** is two-dimensional – increasing the depth of renovation first, to savings of 50 to 80%, and then the rate of energy-efficient renovation to 2% or more p.a. – and so the policy package needs more emphasis on individual advice, incentives, and financing.