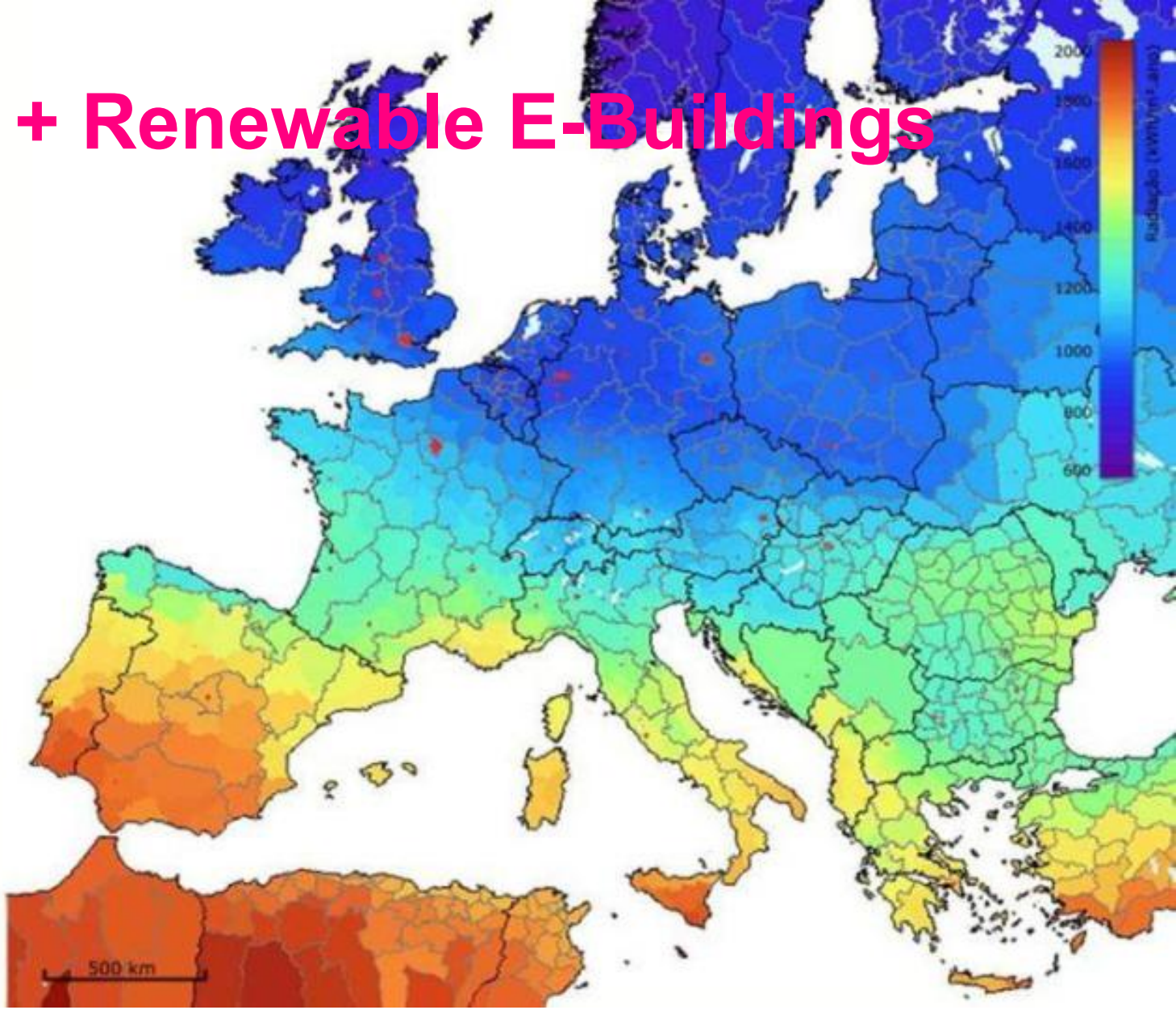
plus-energy buildings in a cooling context

where efficiency and renewables team up

14th Inter-Parliamentary Meeting on Renewable Energy and Energy Efficiency Lisbon 14.10.10 Livia Tirone

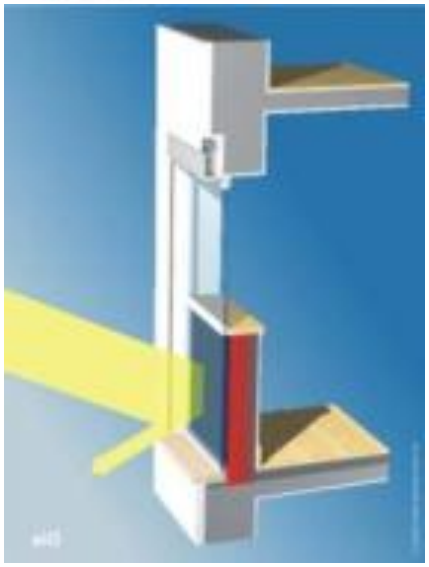
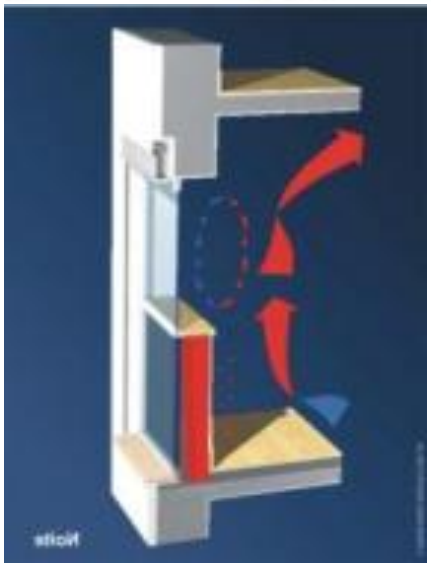
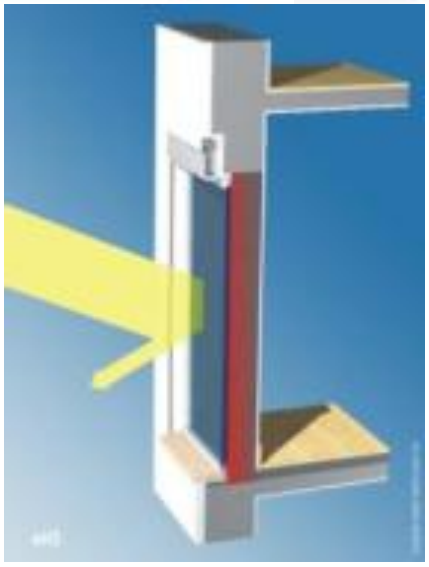
CONSTRUÇÃO SUSTENTÁVEL
SOLUÇÕES PARA UMA PROSPERIDADE RENOVÁVEL

Efficient + Renewable E-Buildings



Solar Radiation in Europe

Efficient E-Buildings

Passive systems

Efficient E-Buildings

Passive systems

Efficient E-Buildings

New, responsive Buildings

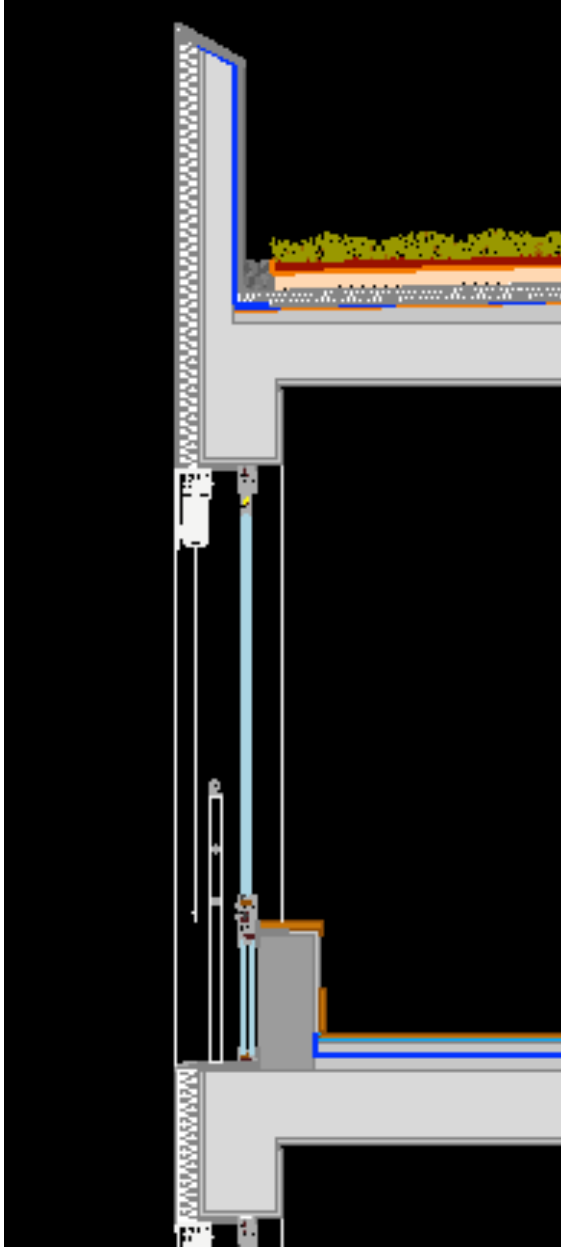
Reject

Store

Temper

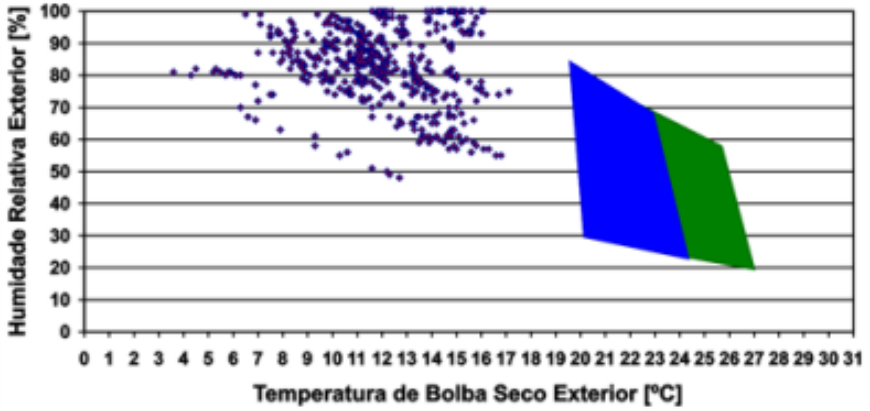
Admit

Redirect

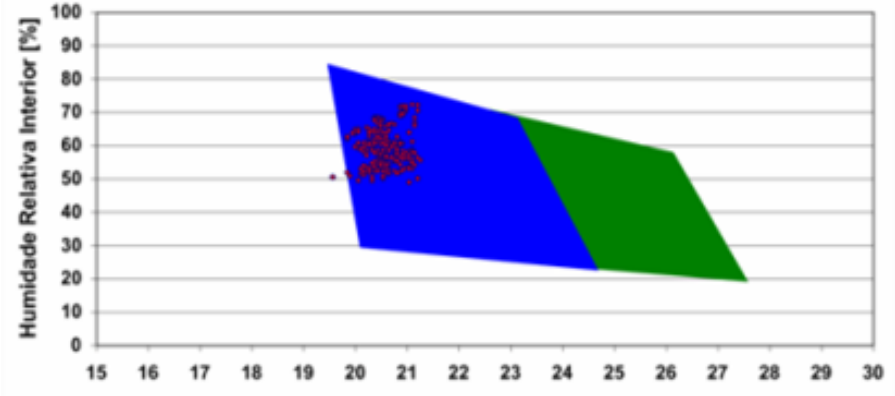


Passive systems

Efficient E-Buildings



Dry Bulb Temperature EXTERIOR and INTERIOR (oC)



Monitorization Results Torre Verde in Lisbon – no heating used in January 2001
In 16 years no apartment has installed cooling systems

+ Renewable E-Buildings

Torre Verde in Lisbon – 70% of DHW supplied by collective solar thermal system

Efficient + Renewable E-Buildings

FAILED TO SCALE

Torre Verde in Lisbon – 70% of DHW supplied by collective solar thermal system

Lessons learned:

Plus energy buildings are real!

But: Good solutions don't scale automatically

Questions raised:

Then how to scale good solutions?

Course of action:

- **Communicate solutions to a wider audience**
- **Involve all Stakeholders - above all the End User – to find solutions via consensus**
- **Address a wider market: refurbishment**
- **Broaden system boundary: building to city**

Member of European Network of Living Labs

BUILDING SECTOR *Actors*

European Institutions · Utilities · Banks · Mortgage Institutions · Insurance Companies · Non Governmental Organizations · Member States · Government Agencies · Research Institutions · Municipalities · Real Estate Promoters · Housing Associations · Design Team · Large Building Contractors · Local Building Contractors · Manufacturers · Real Estate Agents · Real Estate Managers · Collective End-Users · Individual End-Users

Efficient E-Buildings

Existing + refurbished responsive Buildings

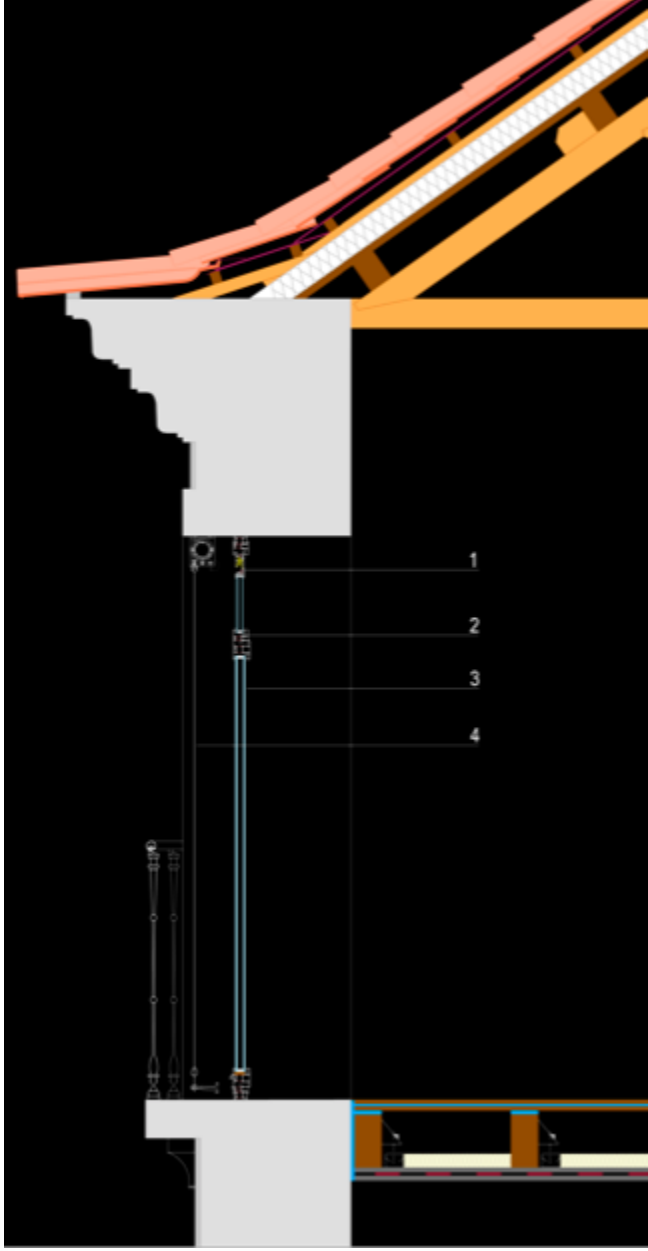
Reject

Store

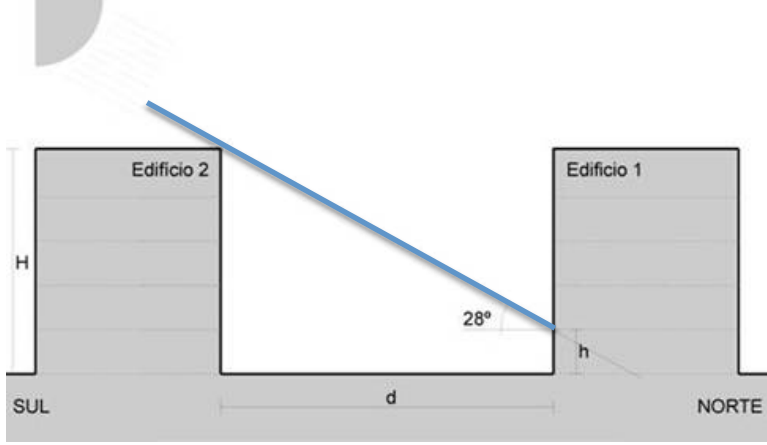
Temper

Admit

Redirect



Efficient E-Cities



H ≈ 0,6 d + h
H – Height of building 2
d – Distance between buildings
h – Height of Ground Level of building 1

Renewable E-Cities

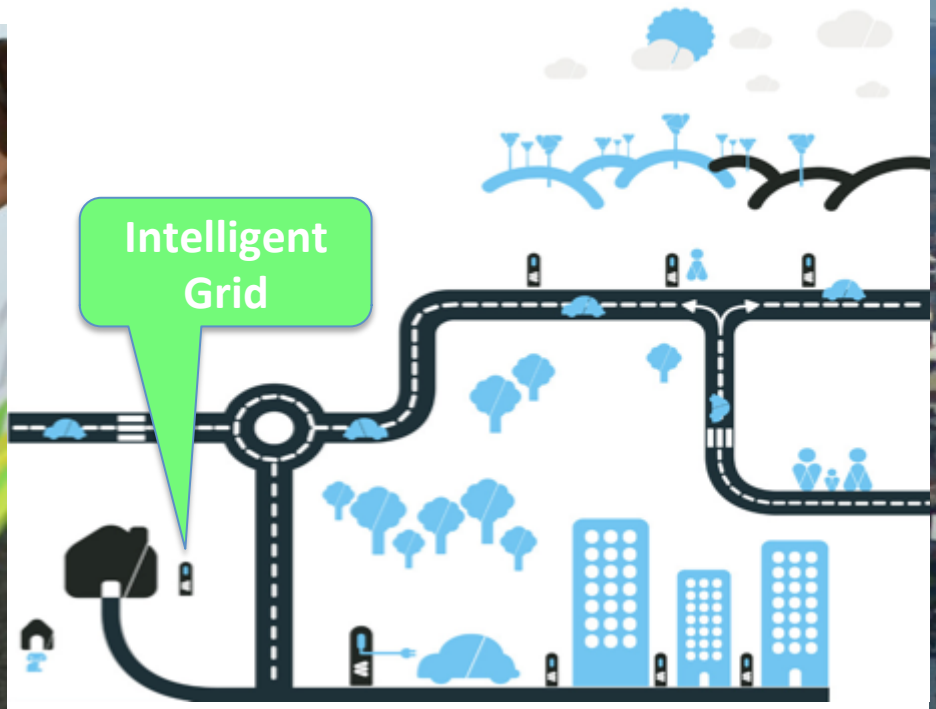
ÁGUA DO TELHADO		PRODUÇÃO ENERGIA	
Orientação Solar / Obstáculos	Radiação Incidente [kWh/(m2.ano)]	Solar Térmico [kWh/(m2.ano)]	Solar Fotovoltaico [kWh/(m2.ano)]
Norte	1.164	497	126
Este	1.435	607	158
Este com obstáculos*	1.435	607	158
Sul	1.858	825	208
Sul com obstáculos*	1.858	825	208
Oeste	1.649	755	184
Oeste com obstáculos*	1.649	755	184
Obstáculos	0	0	0
Coberturas c| mansardas	0	0	0
Superfícies actualmente inaptas	0	0	0

Baixa, Lisbon

Urban Plan integrating Solar Potential

Renewable E-Cities

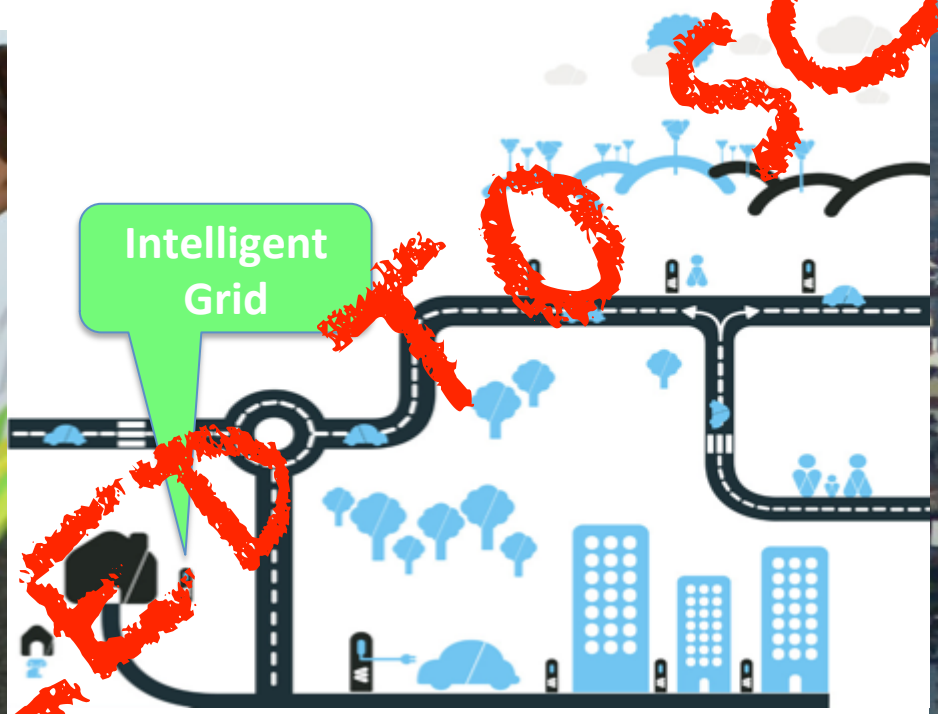
Our economy must add Value
We need to design new urban models



Renewable Prosperity

Renewable E-Cities

Our economy must add Value
We need to design new urban models



FAILED TO SCALE

Renewable Prosperity

Lessons learned… again:

Good solutions don't scale automatically

Questions raised:

Isn't it the role of policies to scale good solutions?

Course of action for scaling:

Reframe the challenges around people!
Engage all stakeholders
Build on holistic consensus based solutions
Set policy precedents promoting good practices
Innovate with new business models

What do Europeans expect?

What do Europeans expect?

Identity

Collaboration

Flexibility

Diversity (Biodiversity)

Redundancy

Decentralization

Autonomy

What do Europeans expect?

Robust

Efficient

Transparent

Effective

Intelligent

Prepared

Connected

What do Europeans expect?

If Europe is serious about resource services, policies need to address the fundamental question of resource ownership…

Who is the rightful owner of finite resources?
Who is the rightful owner of renewable resources?
What rights and duties does this ownership entail?
What is the right price to attribute to resource services?

It needs to be impossible for any stakeholder to benefit from inefficiency and waste…

What do Europeans expect?

A better performing built environment:

long lasting, robust, healthy, comfortable, affordable…

Does this mean:

Energy services?

Energy at true cost price?

Free Energy?

Policies need to promote broad prosperity!

What do Europeans expect?

If Europe is serious about broad prosperity, its processes need to promote true innovation…

A path not known, trust emerging often informal solutions, promote creative leadership and broad societal engagement…

THINK SCHOOL OF CREATIVE LEADERSHIP

plus-energy buildings in a cooling context

where efficiency and renewables team up

THANK YOU…

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Livia Tirone

mail@liviatirone.com www.construcaosustentavel.pt

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Efficient E-Cities