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EUROPÄISCHES INSTITUT FÜR  
ENERGIEFORSCHUNG  
INSTITUT EUROPEEN DE RECHERCHE  
SUR L'ENERGIE  
EUROPEAN INSTITUTE FOR ENERGY

# Effective application of instruments for energy efficient communities

Energy Efficient Communities –  
technological strategies and their implementation

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- Annex 51 Subtask A
  - Recommendations
- Quartier Franklin, Mulhouse, FR
  - Objectives
  - Implementation Strategy
  - Set of policies
  - Technical Monitoring (Efficiency)
- Conclusions
  - Objectives and actions in urban development projects



## Recommendations

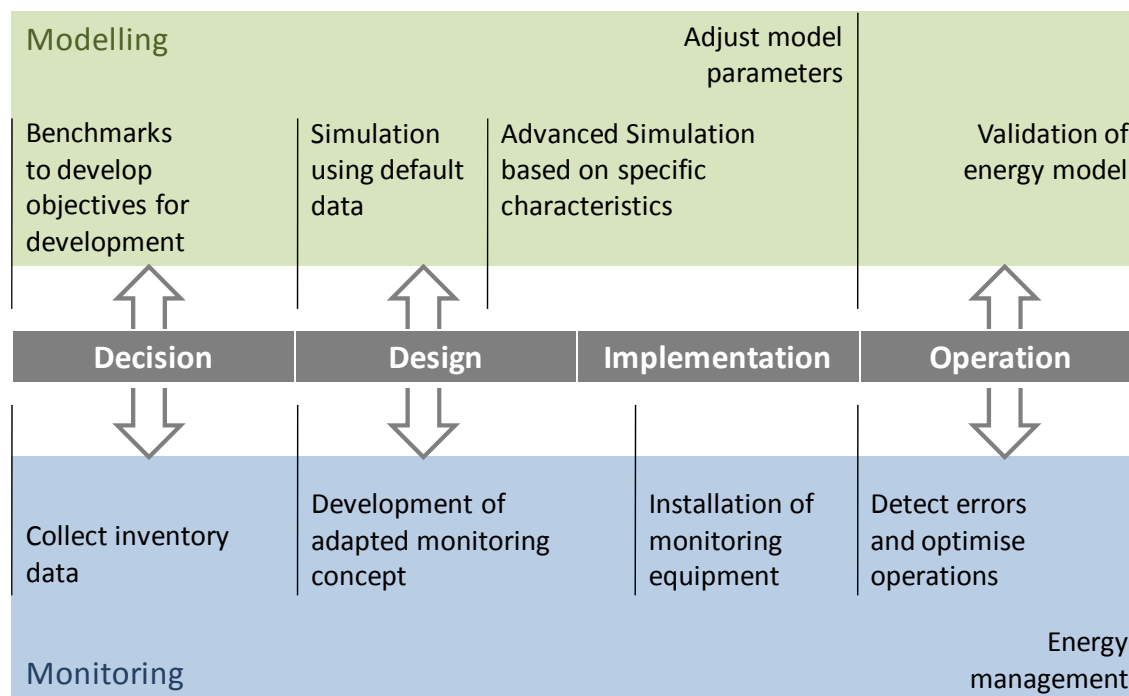
- Identify and focus on most important objectives
- Develop implementation strategy (actors, policies)
- Define indicators for success
- Measuring success – Monitoring

<b>Target setting</b>	Energy Efficiency Energy from RES CO <sub>2</sub> emissions
<b>Sticks- regulatory schemes</b>	Spatial & urban planning Contractual agreements Building regulation Standards & labelling Taxes
<b>Carrots – financial incentive schemes</b>	Tax reductions, tax credit, soft loan. Capital or operating grants and subsidies Feed-in tariffs
<b>Tambourine</b>	Information Promotion Training Competition Demonstration projects



## Recommendations

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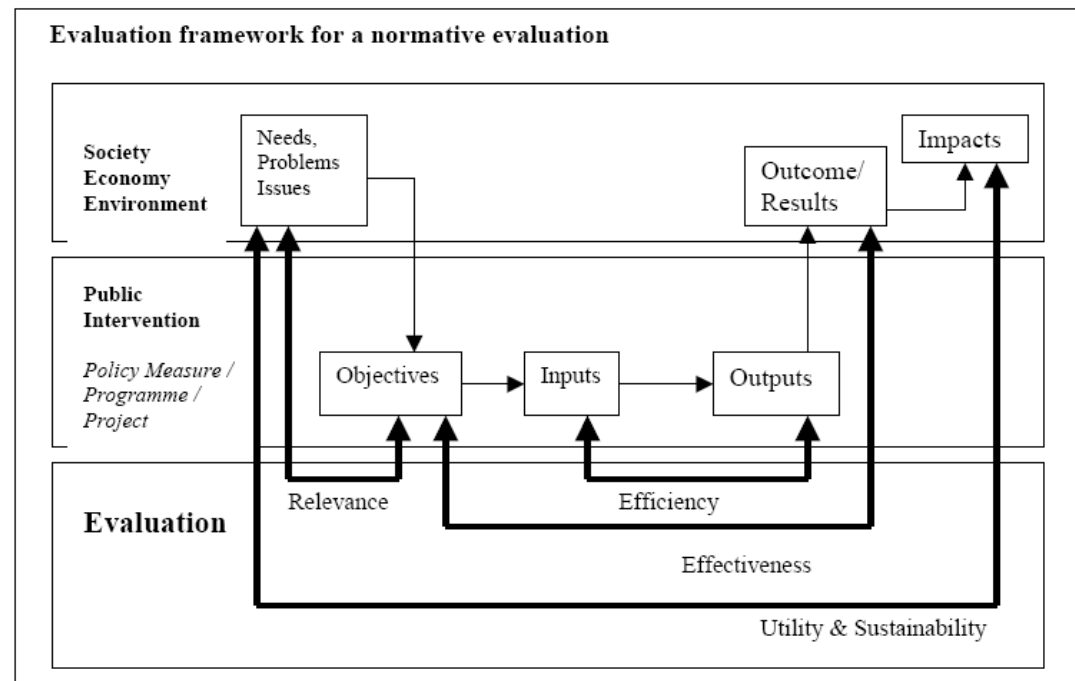


Koch, Kersting, (2011)



## Recommendations

- Identify and focus on most important objectives
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- Measuring success – Monitoring



Vreuls, (2005)



## Quartiers Anciens de Mulhouse

- Built between 1850 and 1910
- Grand Project Ville (2001-2006)
- Urban Rehabilitation Programme (PRU) since 2006

Source: SERM after studio d'architecture & d'urbanisme Roland Spitz



## Objectives for the urban rehabilitation project

While reducing energy demand also economic and social axis of sustainable development is to be respected

- Protect the heritage site of the old industrial settlement
- Attract range of people to avoid ghetto-formation
- Enable habitants to stay/return by maintaining local rent level
- Deliver a showcase project for energy efficiency in the existing building stock
- Use the operation as a means to pass on the know-how on urban rehabilitation projects (documentation and dissemination)





## Technical objectives

- Reduce primary energy use to 50 kWh/m<sup>2</sup> (BBC) from 300 - 400 kWh/m<sup>2</sup> today
- First French project targeting BBC in the building stock
- Preservation of historic facades
- Measured results had to be delivered after completion

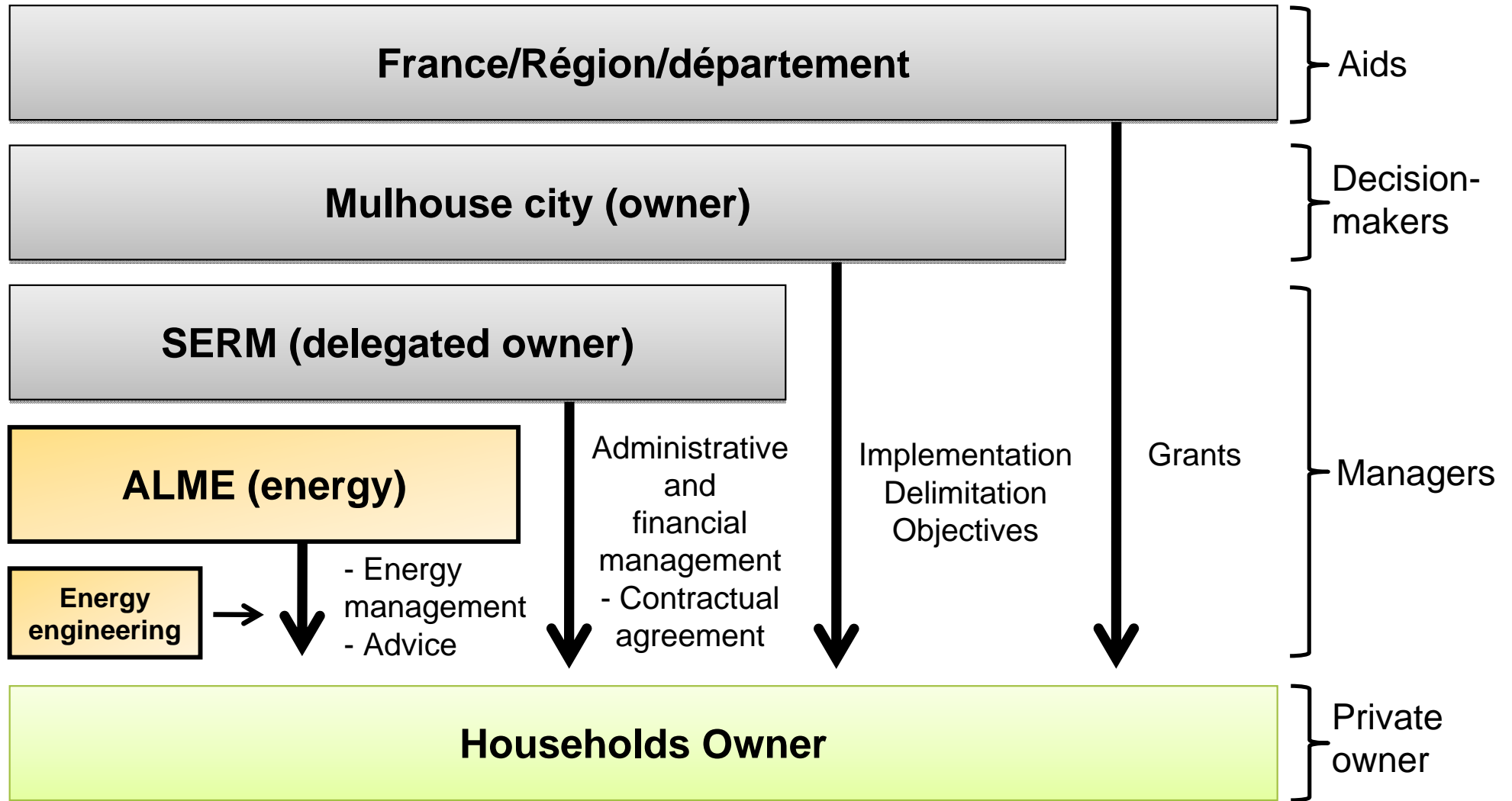






## Implementation strategy

- Set-up of a public operational body (Société d'Équipement de la Région Mulhousienne - SERM) to coordinate the complete urban rehabilitation programme (OPAH)
- Technical lead by the local energy agency ALME to link owners, tenants and local enterprises
- For ambitious renovation schemes (BBC) buildings were acquired by SERM and sold below market price with contractual obligations (target 15% of stock)
- Promotion of energy saving measures through Pole de Competitivite Alsace



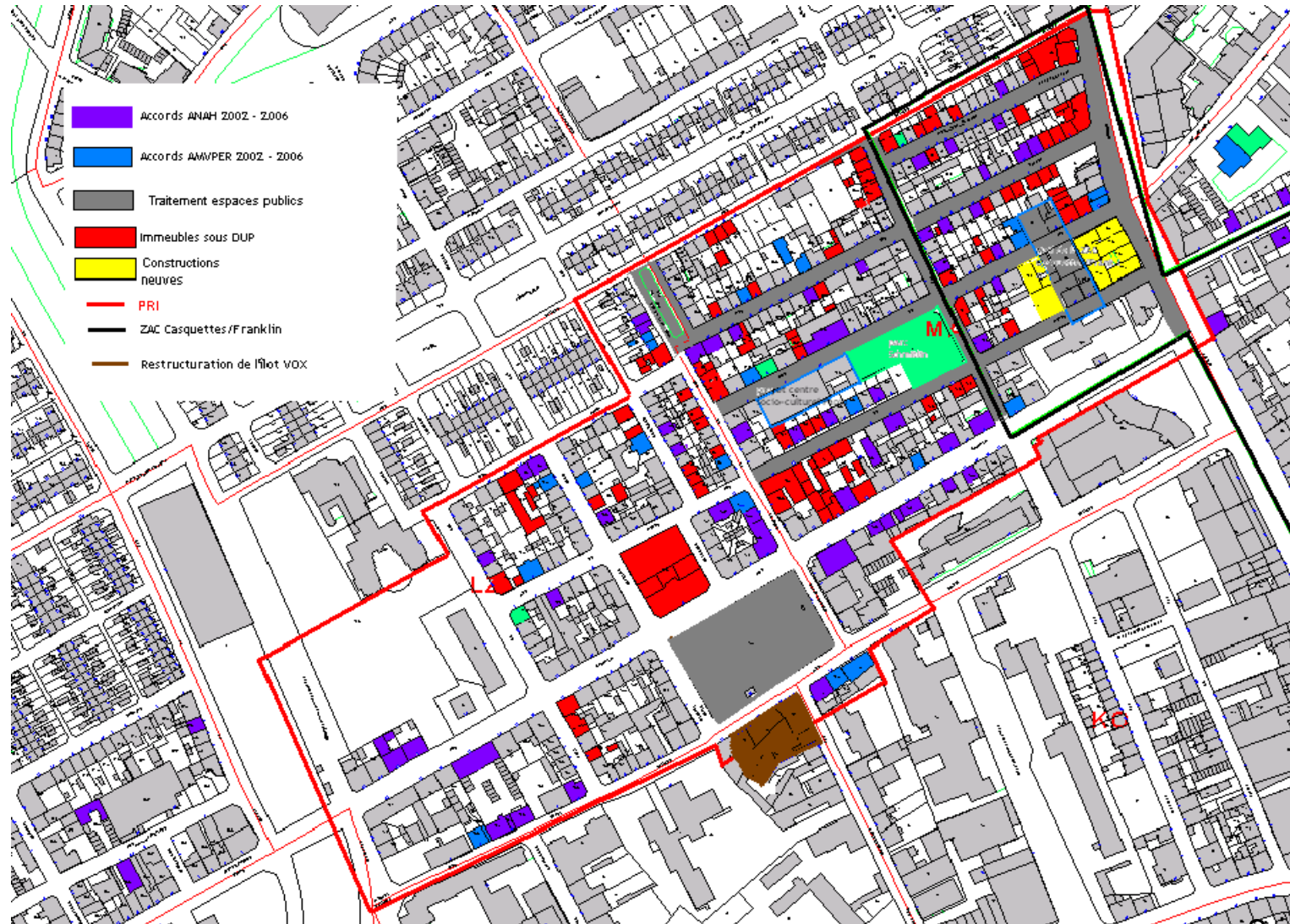


## Mix of Instruments

- Housing Improvement Scheme - OPAH RU (Opération programmée d'amélioration de l'habitat)
- Heritage Protection Area – ZPPAUP (Zone de protection du patrimoine architecturale urbaine et paysager)
- Private Housing Restoration Scheme (Quartier Franklin) - ORI (Opération de restauration immobilière)
- Urban Development Zones - ZAC (Zones d'Aménagement Concerté)
  - ZAC Casquettes Franklin
  - ZAC Lefebvre
  - ZAC Les Jardins Neppert
- Tax reductions for energy related costs of renovation measures



## Mix of Instruments



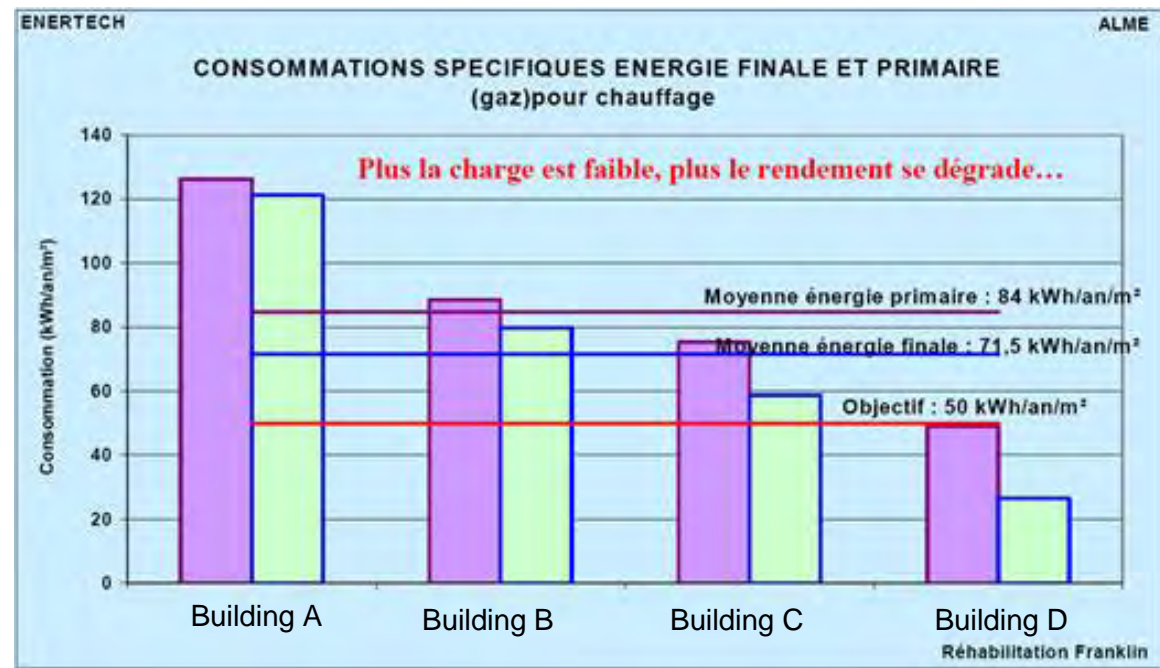
Source: SERM





## Technical monitoring

- Measurements of final energy use and domestic hot water conducted in the first 13 buildings (Enertech)
- Targets of  $<50 \text{ kWh}_{\text{primary}}/(\text{m}^2\text{a})$  partly reached in first years of operation





## Lessons learned after the first years of operation of 15 finished buildings

- ✓ Formation of craftsmen provided for a local knowledge base with indication for decreasing price level of the works
  - ✓ Documentation via Pole de Competitivite in the Alsace region
  - ✓ Level of subsidies kept the rent level stable throughout the process
  - ✓ High energy performance level after renovation
  - ✓ Create a “low energy” dynamic in the city
- 
- Tenants did often not return to their former homes
  - First year of operation shows potential to optimise energy balances
  - Still existing technical problems regarding air-tightness and coordination of building envelope and heating system
  - No easy reproducibility due to public funding







Holistic set of performance criteria

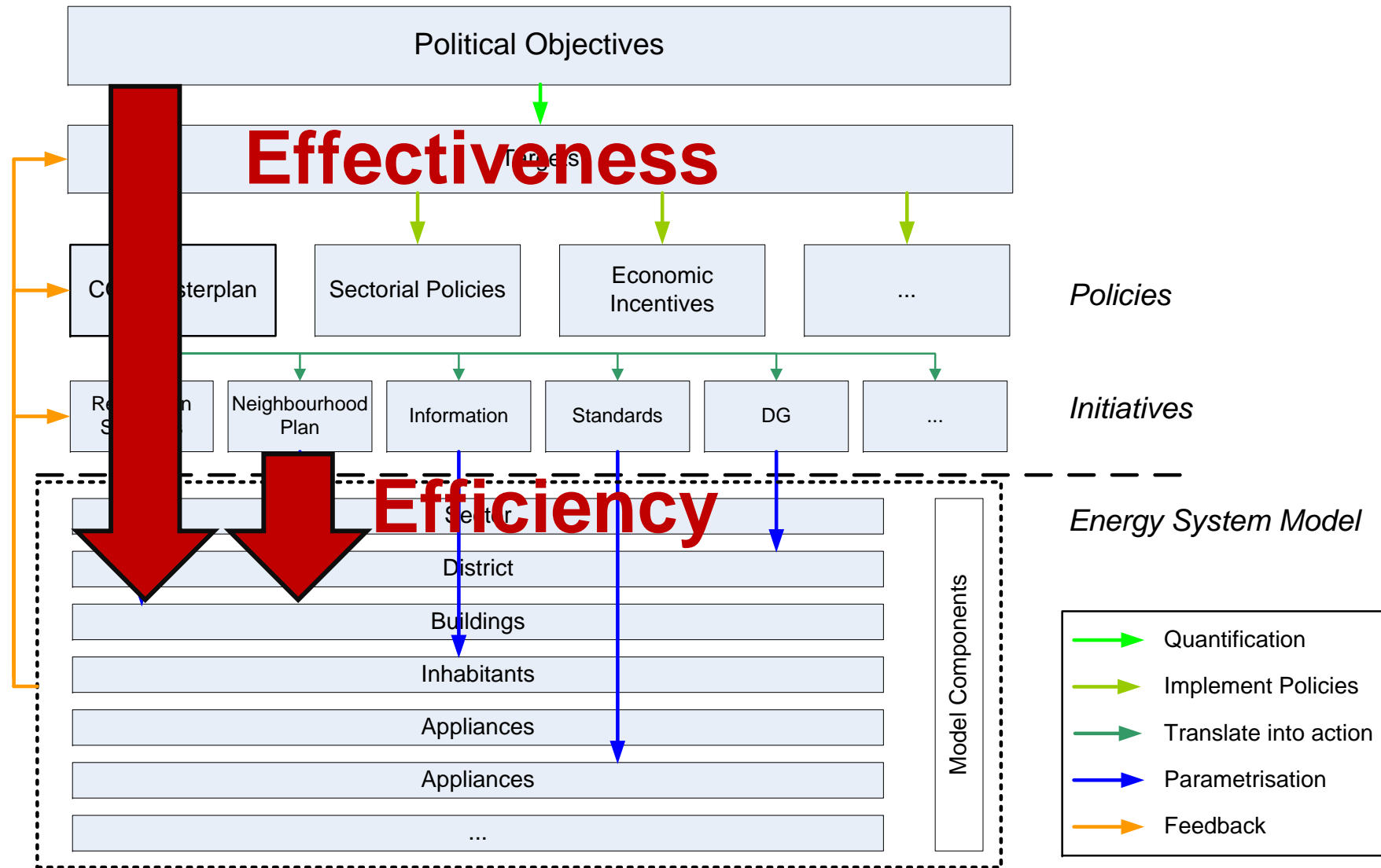
- Energy efficiency is but one indicator in an urban context
- Measurable and comparable indicators required for all main objectives
- Assessment of the whole process chain

Transparent project assessment

- Create environment for independent assessment
- Promote strengths but don't forget the weaknesses (lessons learned)

Account for cross-impact of different measures

- Establish work relations across sectors



# Acknowledgement



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[www.annex51.org](http://www.annex51.org)



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# Subtask A - Conclusions

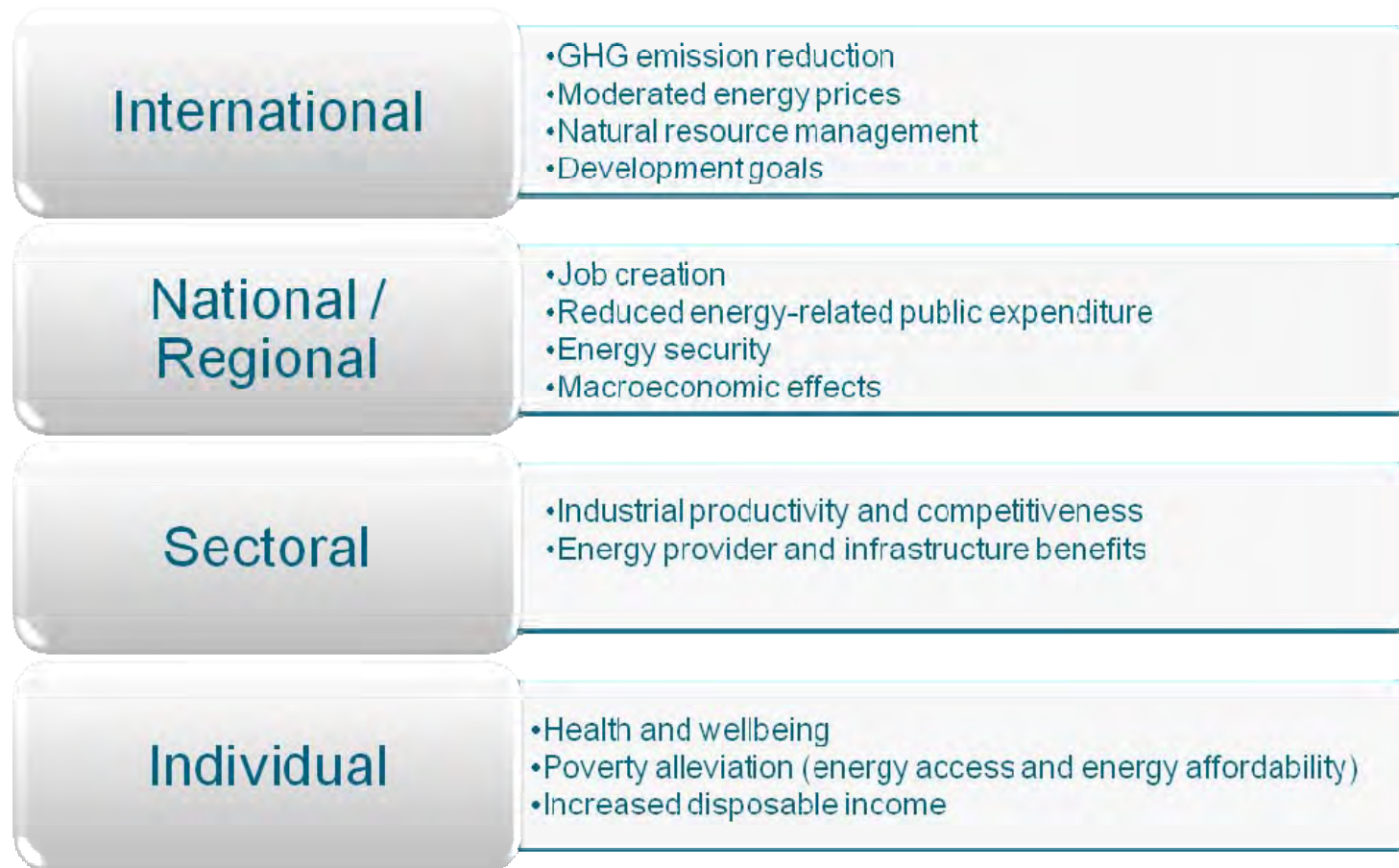


Regulatory Instruments	Regulatory and Control mechanisms	Regulation	Sticks
<ul style="list-style-type: none"> <li>- Mandates/standards</li> <li>- Regulatory reform</li> <li>- Labelling</li> <li>- Voluntary agreements</li> </ul>	<ul style="list-style-type: none"> <li>- Appliance standards</li> <li>- Building codes</li> <li>- Procurement regulations</li> <li>- Energy efficiency obligations</li> <li>- Mandatory audits and labelling</li> <li>- Utility DSM programs</li> </ul>	<ul style="list-style-type: none"> <li>- Building Code + enforcement</li> <li>- Minimum Equipment Energy Performance Standards</li> </ul>	<ul style="list-style-type: none"> <li>- Urban planning</li> <li>- Building regulations</li> <li>- Building codes</li> <li>- Taxes</li> <li>- Standards and mandates</li> </ul>
Market-Based Instruments	Economic and Market-Based Instruments	Economic Incentives	Carrots
<ul style="list-style-type: none"> <li>- GHG Emissions Trading</li> <li>- Green Certificates</li> <li>- Project-based programmes</li> </ul>	<ul style="list-style-type: none"> <li>- Energy performance contracting</li> <li>- Cooperative procurement</li> <li>- Energy efficiency certificate schemes</li> <li>- Kyoto flexibility mechanism</li> </ul>	<ul style="list-style-type: none"> <li>- Project-relates subsidies</li> <li>- Financial guarantees</li> <li>- Reduced-interest loans</li> <li>- Taxes</li> <li>- Grants</li> <li>- Technology procurement</li> <li>- Third-party financing facilitation</li> <li>- Certificate trading scheme</li> </ul>	<ul style="list-style-type: none"> <li>- Capital grants and rebates</li> <li>- Operating grants</li> <li>- Investments in private activities</li> <li>- Soft loans and loan guarantees</li> <li>- Tax credits, planning cost reductions</li> <li>- Tax reductions and accelerated depreciation</li> </ul>
Fiscal Instruments	Fiscal Instruments and Incentives		
<ul style="list-style-type: none"> <li>- Taxes</li> <li>- Tax exemption and credits</li> <li>- Fees/ charges</li> <li>- Refund systems</li> <li>- Grants</li> <li>- Preferential loans</li> </ul>	<ul style="list-style-type: none"> <li>- Taxation</li> <li>- Tax reductions / exemptions</li> <li>- Public benefit charges</li> <li>- Capital subsidies</li> </ul>		
Voluntary Agreements	Voluntary Action and Information	Voluntary Agreements	Voluntary Actions
<ul style="list-style-type: none"> <li>- Monitored emission-reduction quotas with penalties (strong)</li> <li>- Non-monitored emission-reduction quota (weak)</li> <li>- R&amp;D projects, programmes</li> </ul>	<ul style="list-style-type: none"> <li>- Voluntary certification and labelling</li> <li>- Voluntary and negotiated agreements</li> <li>- Detailed billing and disclosure programs</li> <li>- Public leadership programs</li> <li>- Awareness raising, education, information campaigns</li> </ul>	<ul style="list-style-type: none"> <li>- Industrial Companies</li> <li>- Electricity production, transformation and distribution companies</li> <li>- Commercial or institutional organisations</li> </ul>	<ul style="list-style-type: none"> <li>- Procurement / Purchase</li> <li>- Investment</li> <li>- Municipal utility</li> <li>- Demonstrations and land use</li> <li>- Voluntary agreements</li> </ul>
Policy Process		Information	Guidance
<ul style="list-style-type: none"> <li>- Advice</li> <li>- Aid in Implementation</li> <li>- Consultation</li> <li>- Outreach</li> </ul>	<ul style="list-style-type: none"> <li>- Labelling</li> <li>- Information Centres</li> <li>- Energy Audits</li> <li>- Education and Training</li> <li>- Demonstration</li> </ul>	<ul style="list-style-type: none"> <li>- Information</li> <li>- Promotion</li> <li>- Training</li> </ul>	
Pershing, Varangu et al. 2000	Ürge-Vorsatz, Koepfel 2007	Vreuls 2005	IEA 2009





## Measuring Success – multiple dimensions of urban redevelopment projects



after Ryan, Campell (2012)



## Measuring Success – multiple dimensions of urban redevelopment projects – Quartier Franklin

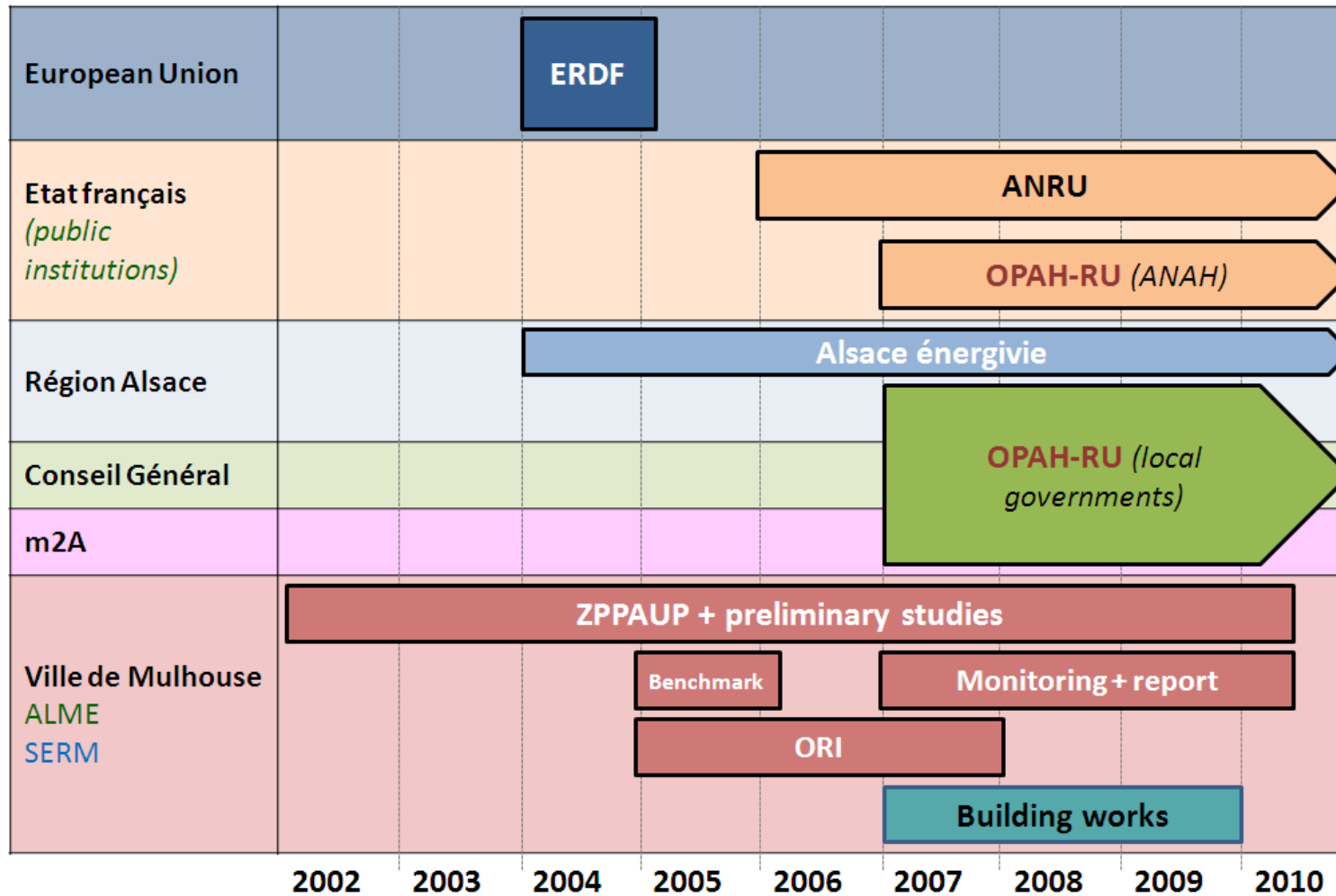


after Ryan, Campell (2012)

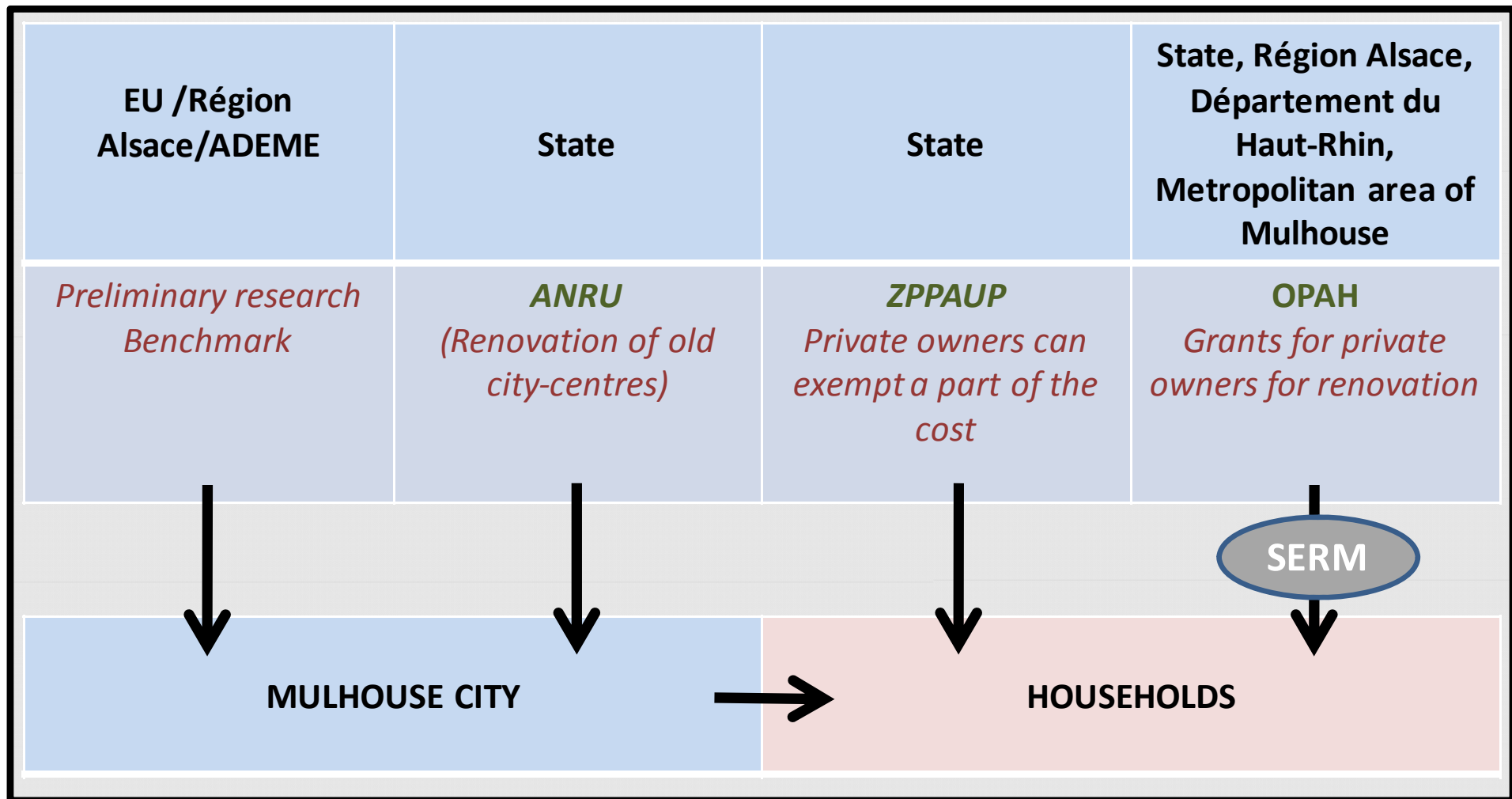
# Quartier Franklin – Mulhouse, FR



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Boutaud, Koch, Girault, (2011)



# Housing Improvement Scheme (OPAH)

