

# 'Building' Energy Efficiency Action Plans

*Presentation by Pedro Guertler, Association for the Conservation of Energy, wearing a European Alliance of Companies for Energy Efficiency in Buildings (EuroACE) hat*

*Development of a proposal for a template for Member States' Energy Efficiency Action Plans, required under the Energy End-use Efficiency and Energy Services Directive, covering the buildings sector*

# Overview

- Background
- Approach
- Development
- Conclusions

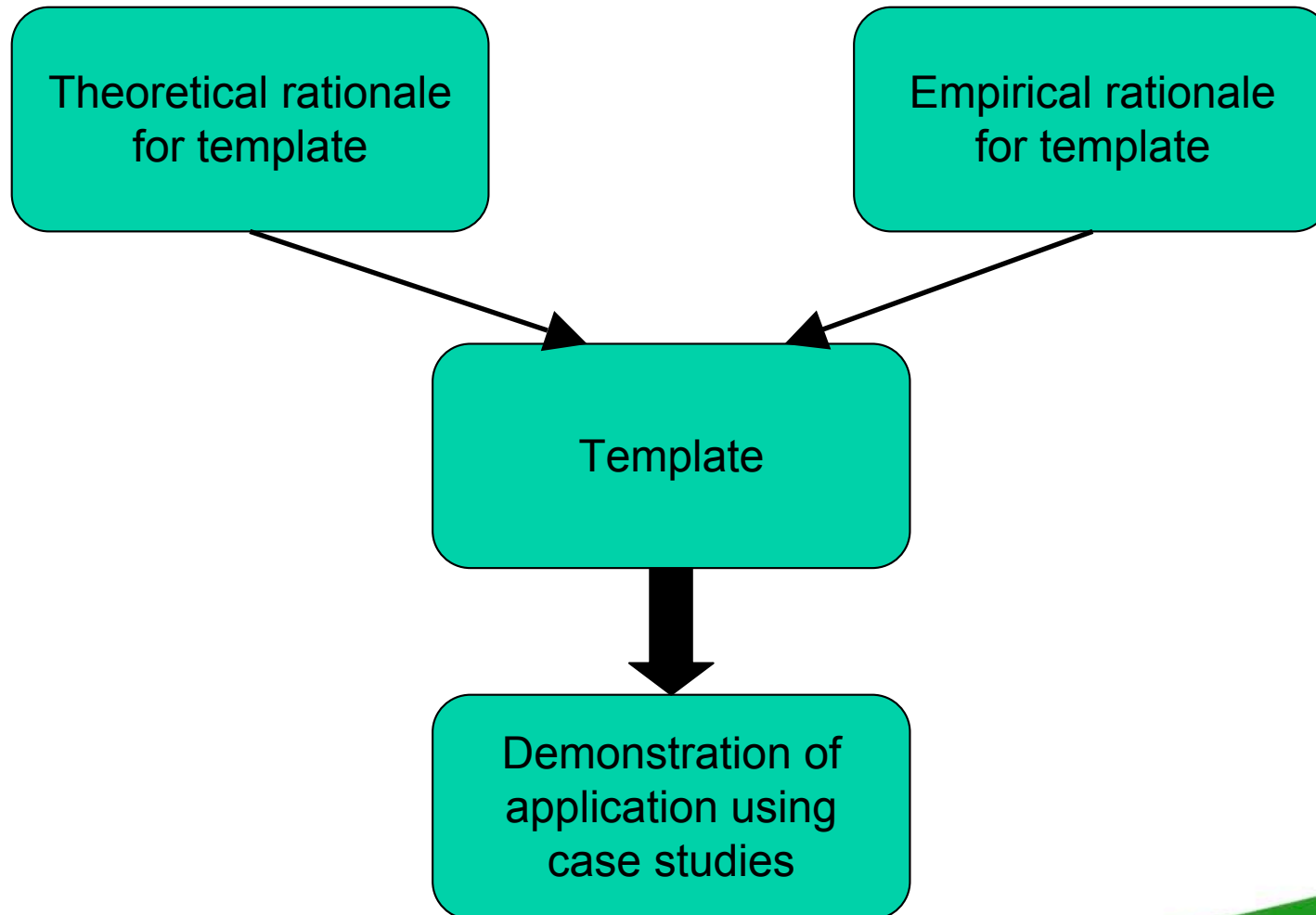
# Background

- Energy Services Directive requires National Energy Efficiency Action Plans (NEEAPs) to be submitted to the Commission by end June 2007
- DG TREN wants to be able to assess NEEAPs in a consistent manner
- EuroACE interested in contributing its expertise by developing a sectoral template proposal

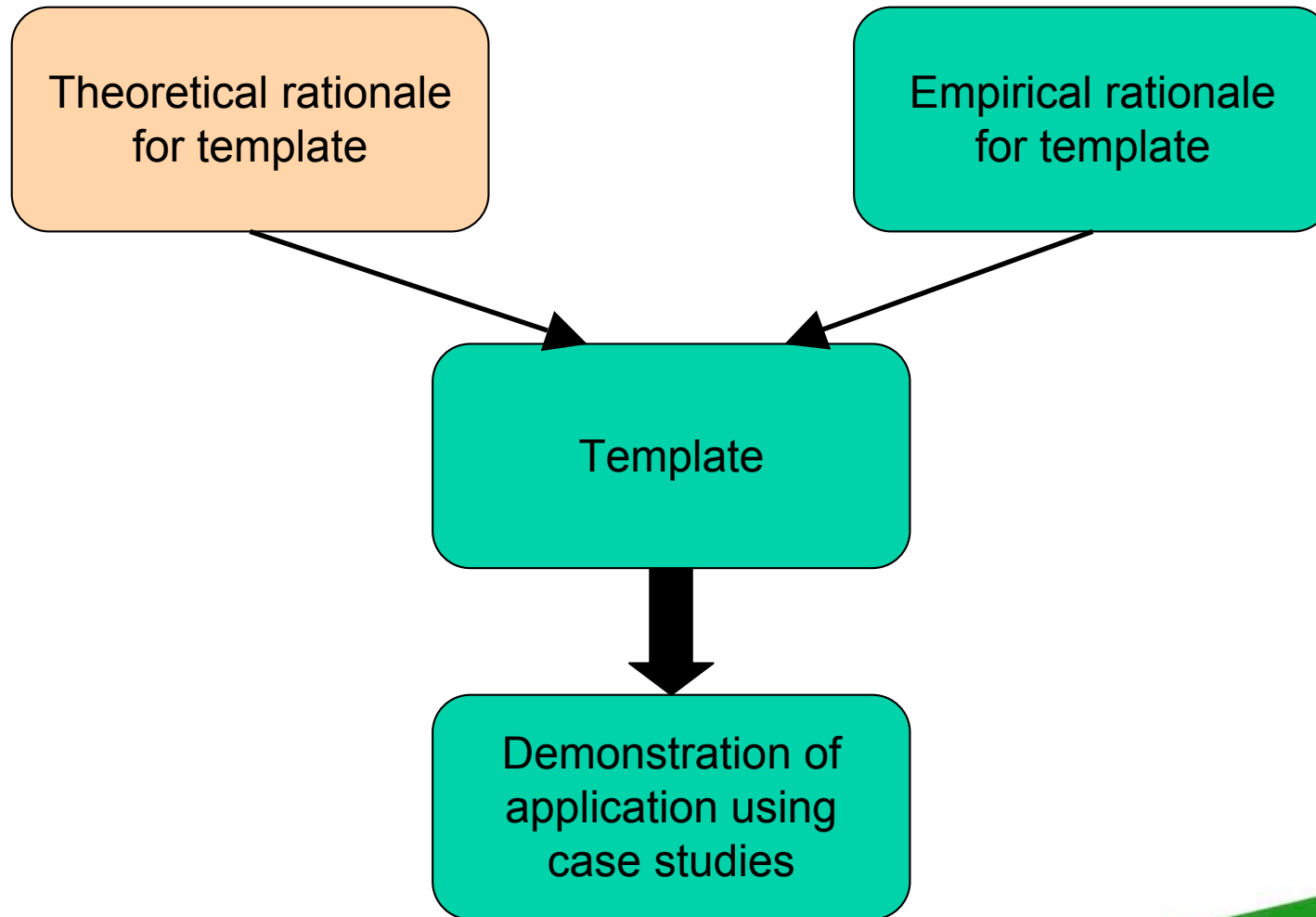
# Background

- In parallel:
  - Consultancy carrying out an assessment of Member States' energy saving potential to 2020 for DG TREN
  - Intelligent Energy Europe EMEEES project developed harmonised energy savings calculation methodology for NEEAPs, including a template approach
  - Other organisations developing templates for other sectors, mirroring EuroACE (e.g. lighting, transport)

# Approach



# Development – theoretical



# Development – theoretical

- Review of existing National Energy Efficiency Action Plans (NEEAPs) from across OECD countries

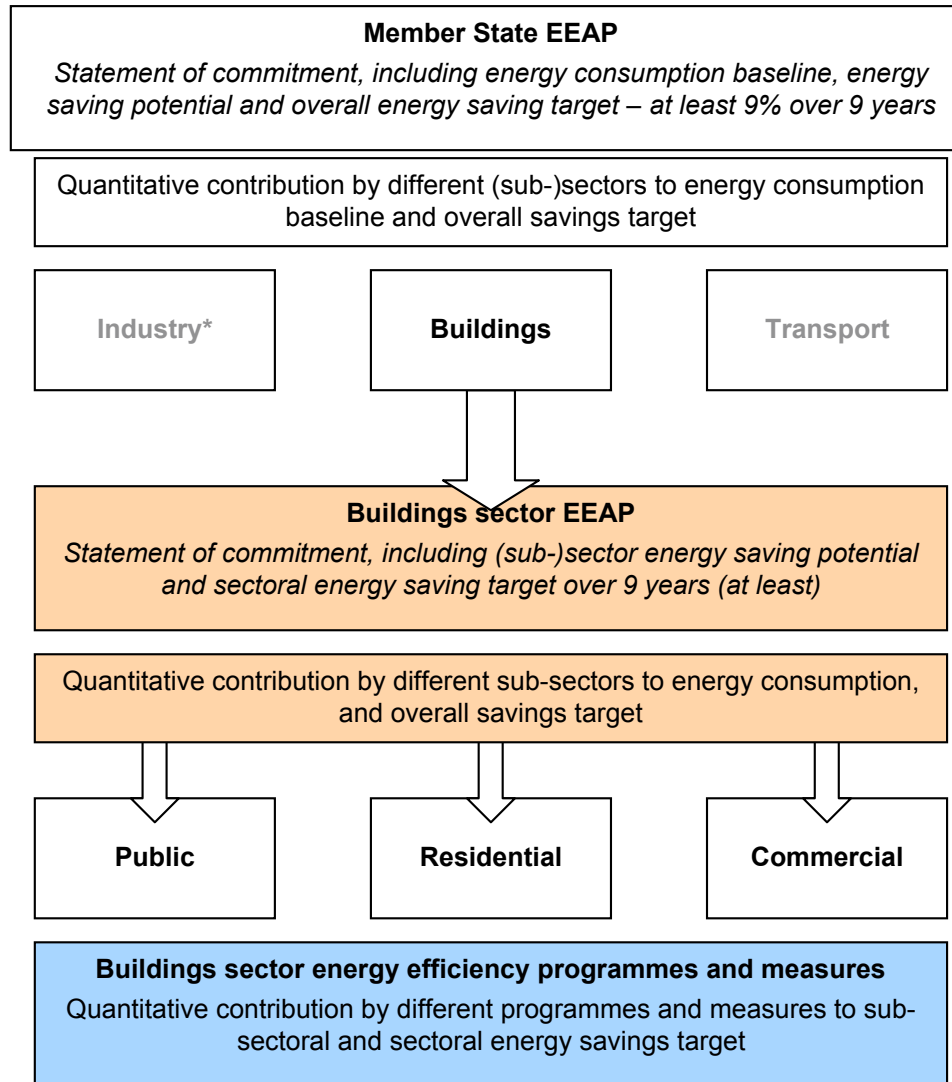
# Development – existing NEEAPs

BUILDINGS AND APPLIANCES PROGRAMME			
Output Activity	Key Measures	Timeframe	Responsibilities*
<b>Information and education</b> All groups (occupiers, owners, builders, and designers) need appropriate information so they are empowered to make better decisions.	<b>Components</b> <ul style="list-style-type: none"> <li>• Mass and glazing optimisation design guides for buildings.</li> <li>• Water heating technology programme, including solar.</li> <li>• Energy labelling and MEPS development.</li> <li>• High efficiency domestic luminaires design competition and development.</li> </ul>	Established by 2002/03. Networks established by 2002/03. Ongoing. Developed by 2002/03.	EECA, MFE, engaging with wide range of players in the building industry, appliance suppliers, etc.
	<b>Whole Building</b> <ul style="list-style-type: none"> <li>• Instigate programme with aim of developing national Home and Building Energy Rating Schemes (HERS and BERS).</li> <li>• Energy efficiency and renewables information gathering and dissemination programmes eg, HEEP and BEEP, energy benchmarking studies.</li> </ul>	Pilot and trial by 2002/03, implement 2005. Ongoing.	EECA, Environment Canterbury (Pilot HERS), BRANZ, industry stakeholders.
<b>Standards</b> Voluntary and mandatory Standards to establish minimum performance levels and best practice targets for design and operation.	<b>Components and Design</b> <ul style="list-style-type: none"> <li>• Develop better and best practice design standards and guides.</li> <li>• Commercial buildings and building services design support.</li> <li>• Develop a standard or a code of practice to define good practice in the commissioning and operation of building systems.</li> <li>• Develop a new standard for insulation materials and installation.</li> </ul>	Completed by 2004/05. Ongoing design - implement from 2004. Development by 2004. Development by 2003.	EECA, BRANZ, SNZ, BIA, building industry stakeholders.
	<b>New Zealand Building Code</b> <ul style="list-style-type: none"> <li>• Review and amend, as appropriate, the New Zealand Building Code Clause H1 – Energy Efficiency (applies to residential and commercial) under the existing periodic review process determined by the Building Industry Authority.</li> </ul>	Review every five years starting 2003.	BIA, EECA, BRANZ, SNZ, building industry stakeholders.
<b>Implementation Support</b> Seventy percent of housing stock was built before the first minimal codes. These houses are often damp and cold and should be improved for health reasons.  All existing commercial buildings are pre New Zealand Building Code H1 and should be assessed and upgraded.	<ul style="list-style-type: none"> <li>• Residential grants funding supporting two current transitional programmes:                             <ul style="list-style-type: none"> <li>• Sustainable market-based activities in the residential sector and</li> <li>• Socially focussed residential retrofit programme to assist energy upgrades on lower socio-economic housing.</li> </ul> </li> <li>• Further development of residential grants programmes</li> <li>• Housing New Zealand efficiency retrofit programme and other initiatives.</li> <li>• Commercial buildings commissioning and maintenance skills upgrading.</li> </ul>	Transitional through 2001/02, re-assess by June 2002.  2002/03 onwards. Ongoing. Initiate from 2002.	EECA, engaging with iwi, energy trusts, residential energy efficiency businesses, LAs and the wider community.  Housing New Zealand Corporation EECA, engaging with industry stakeholders.
	<b>Research</b> Research to underpin energy initiatives.	<ul style="list-style-type: none"> <li>• Health and Energy in Residential Buildings Research Project – a study of 1400 houses to determine health impacts of poor energy efficiency.</li> </ul>	Ongoing - completed by 2003/04.

# Development – theoretical

- Review of existing NEEAPs from across OECD countries
- Context and definition for buildings sector  
NEEAP template

# Development – theoretical



# Development – theoretical

- Review of existing NEEAPs from across OECD countries
- Context and definition for building sector NEEAP template
- Review of good reporting principles in light of DG TREN's requirements (e.g. EMAS, GRI, AccountAbility), such as:
  - Materiality
  - Completeness
  - Comparability
  - Balance
  - Auditability
  - Clarity
- → **Wishlist for NEEAP *form***

# Development – wishlist for form

Introduction	
Statement of commitment/Foreword	<i>This is often written by the relevant minister – stating the intention and commitment to energy saving</i>
What is the current situation/baseline	<i>A cross -sub -sectoral overview of current energy use and historical trends</i>
Predicted growth	<i>Future growth of energy consumption disaggregated to sub sectors</i>
Overall saving target	<i>The savings target for the buildings sector, including time period</i>
Lessons from current efforts	<i>How this will influence the programmes proposed for the Directive</i>
Statement of commitment/Foreword	<i>This is often written by the relevant minister – stating the intention and commitment to energy saving.</i>

Building energy efficiency programme or measures (required for each)	
Name	<i>Name of the programme or measure</i>
Historical background to regulation	<i>Links back to lessons from current efforts and describes how targets and programmes have evolved to this stage</i>
Barriers identified What barriers it overcomes	<i>The barriers are often those which the ESD and EPBD were designed to overcome</i>
Which sector it targets/effects	<i>Where the savings are achieved e.g. buildings, tertiary sector, industry</i>
What measures are proposed	<i>Measures which may be used such as those listed in Annex III of the Directive (see <b>Error! Reference source not found.</b>)</i>
How much it will save – who pockets the savings	<i>The indicative target for the programme, measured in energy and carbon</i>
Who gains from the savings	<i>Also who directly benefits from the improvements (often the target sector)</i>
Full Cost benefit Analysis	<i>This may not be necessary in the template but should be the basis for setting targets. It includes the two points that follow</i>
What are the potential savings (technical/cost -effective)	<i>The absolute best case scenario assuming 100% take up with the most efficient technology</i>
How much it will cost	<i>The financial cost and who will pay for it. This should include administrative costs as well as the materials and labour</i>
Who will bear the cost	<i>Which departments/stake holders are affected</i>
Examples/case studies	<i>Specific examples are useful to illustrate a programme but are more often used to engage the general public</i>
Why alternative programmes were rejected/unsuitable	<i>Very rarely included but it is needed in situations where activities cannot be implemented because they are not cost -effective</i>
Timeframe	<i>When the legislation will be in place and savings are expected to accrue</i>
Method for evaluating result	<i>Bottom up or top down methodology</i>

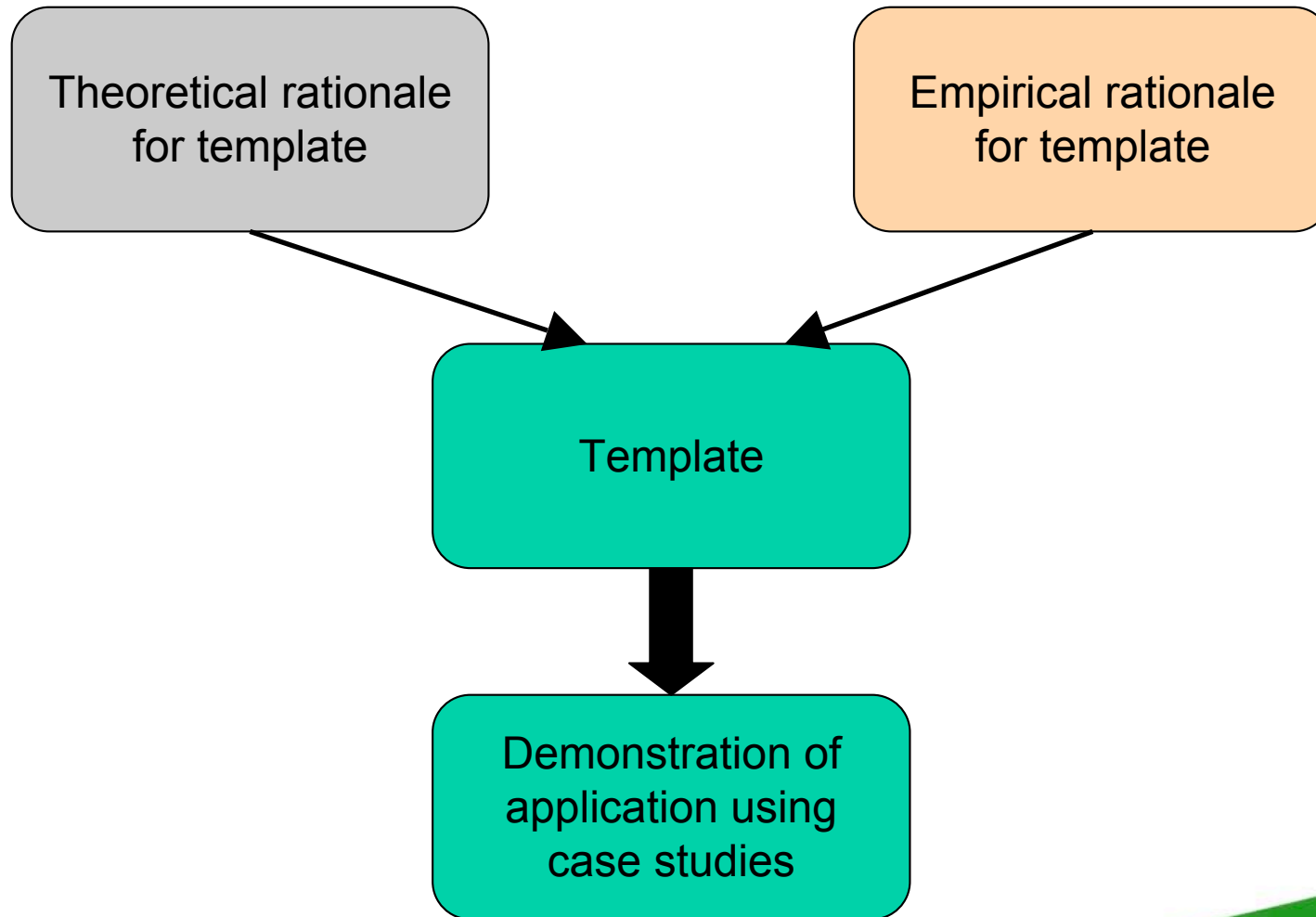
# Development – theoretical

- Review of existing NEEAPs from across OECD countries
- Context and definition for building sector NEEAP template
- Review of good reporting principles in light of DG TREN's requirements (e.g. EMAS, GRI, AccountAbility)
  - Completeness
  - Auditability
  - Compliance
  - Comparability
  - Materiality
  - Relevance
- → Wishlist for NEEAP *form*
- → **Wishlist for NEEAP *content***

# Development – wishlist for content

	Financial		Non-financial	
	Push	Pull	Push	Pull
<b>Pre-investment/ implementation</b>	energy taxes	support of R&D, technical improvements, piloting and demonstration	Building regulations / codes / standards – setting minimum energy performance standards for new buildings; Refurbishment standards; banning products and services, quotas imposed	Voluntary agreements, labelling of appliances and buildings, energy auditing
<b>Investment/ implementation</b>	energy taxes, product taxes	Investment grants, financing, tax relief	White certificates or Energy Efficiency Commitment	n/a
<b>Post-investment/ implementation</b>	energy taxes	Differentiated energy tariffs	Requirement for updating building energy labels regularly	maintenance support and advice
<b>I n d i r e c t programmes</b>	energy taxes	n/a	n/a	Metering / energy information / informative billing; Public sector leadership, information and awareness campaigns, best practice services; training schemes; accreditation schemes

# Development – empirical



# Development – empirical

- Mailout of questionnaire about template to Art. 14 (EPBD) and Art. 16 (ESD) Committees, focusing primarily on the wishlist for template ***form***

# Development – questionnaire

Introduction to each sector or template as a whole						
4		<b>Introduction</b>				
5		Statement of commitment/Foreword	This is often written by the relevant minister – stating the intention and commitment to energy saving.			
6		What is the current situation/baseline	A cross-sectoral overview of current energy use and historical trends.			
7		Predicted growth	Future Growth of energy consumption disaggregated to sectors.			
8		Overall saving target	The indicative savings target – ie 9% figure or greater.			
9		Lessons from current efforts	How this will influence the programmes proposed for the new Directive.			
10		<b>Details</b>	<b>Explanation</b>	<b>er (1-13)</b>	<b>nce (6-5)</b>	<b>ty (6-5)</b>
11		<b>General information</b>				<b>Additional Comments</b>
12		Name	Name of the Programme.			
13		Historical background to regulation	Links back to lessons from current efforts and describes how targets and programmes have evolved to this stage.			
14		What barriers it overcomes	The barriers are similar to the fulfilment of the Directive articles found later.			
15		Which sector it targets/effects	Where the savings are achieved eg buildings, tertiary sector, industry.			
16		What measures are proposed	Measures which may be used such as those listed in Annex III of the Directive.			
17		How much it will save – who pockets the savings	The indicative target for the programme, measured in energy and carbon.			
18		Who gains from the savings	Also who directly benefits from the improvements (often the target sector).			
19		Full Cost benefit Analysis	This may not be necessary in the template but should be the basis for setting targets. It includes the two points that follow.			
20		What are the potential savings (technical/cost-effective)	The absolute best case scenario assuming 100% take up with the most efficient technology.			
21		How much it will cost	The financial cost and who will pay for it. This should include administrative costs as well as the materials and labour.			
22		Who will bear the cost				
23		Examples/case studies	Specific examples are useful to illustrate a programme but are more often used to engage the general public.			
24		Why alternative programmes were rejected/unsuitable	Very rarely included but it is needed in situations an activities cannot be implemented because it is not cost-effective.			
25		Timeframe	When the legislation will be in place and savings are expected to accrue.			
26		Wider context/auxiliary benefits	Links to other EU directives such as the EPBD, EuP, or targets eg employment, air quality, standards of living, or health.			
27		<b>Details</b>	<b>Explanation</b>	<b>er (1-13)</b>	<b>nce (6-5)</b>	<b>ty (6-5)</b>
28		<b>Legislative framework</b>	National legislation and regulations introduced to implement the programme.			<b>Additional Comments</b>
29		Enforcement - penalties for failure to comply	Is anything in place to dissuade non-compliance.			
30		Which articles it fulfills in the ESD	eg Article 5 - Public sector, or Article 6.2.a(ii) - competitively priced energy audits.			
31		Who is responsible for delivering each part of an activity	The bodies who oversee and deliver the programme eg national and regional govt, energy suppliers, installers, manufacturers.			
32		How is the infrastructure set up to deliver it	An analysis of how well the rest of the programme has been implemented eg communications between deliverers, logistics.			
33		How is it monitored/measured	[This is very important but will be left to methodology groups to discuss. A technical appendix to the EEAP could be added.]			
34						
35						
36						

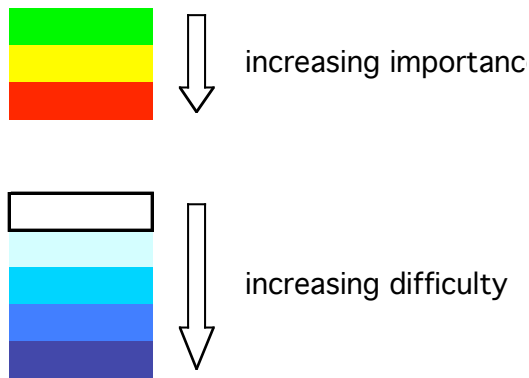
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# Development - questionnaire

	I	D	
<b>Introduction</b>			
Statement of commitment/Foreword	Green	White	
What is the current situation/baseline	Red	Light Blue	
Overall saving target	Red	Light Blue	
Predicted growth	Red	Dark Blue	
Lessons from current efforts	Red	Dark Blue	
<b>General Information</b>			
Name	Green	White	
Which buildings sector it targets/affects	Red	Light Blue	
Historical background to programme	Yellow	Light Blue	
What measures are proposed	Red	Light Blue	
What barriers it overcomes	Red	Dark Blue	
How much it will save - who pockets the savings	Red	Light Blue	Green, Yellow, Red
Who gains from the savings	Red	Light Blue	Green, Yellow, Red
What are the potential savings (technical/cost-effective)	Red	Dark Blue	Green, Yellow, Red
Full Cost benefit Analysis	Yellow	Dark Blue	
How much it will cost	Red	Dark Blue	
Who will bear the cost	Red	Light Blue	
Why alternative programmes were rejected/unsuitable	Green	Light Blue	White, Light Blue
Examples/case studies	Yellow	Dark Blue	
Timeframe	Red	Light Blue	
Wider context/auxillary benefits	Yellow	Dark Blue	
Legislative framework	Red	Light Blue	
Who is responsible for delivering each part of an activity	Red	Light Blue	
Which articles it fulfils in the ESD	Red	Light Blue	
Enforcement - penalties for failure to comply	Yellow	Light Blue	
How is the infrastructure set up to deliver it	Red	Dark Blue	
How is it monitored/measured	Red	Dark Blue	



# Development – questionnaire

- Helped to:
  - Establish what the template ought to include
  - Double-check whether a separate section for buildings is necessary (unanimous 'yes' from respondents)
  - Rank the order, importance and difficulty of the template's components, to move towards the final template *form*

# Development – empirical

- Mailout of questionnaire about template to Art. 14 (EPBD) and Art. 16 (ESD) Committees, focusing primarily on the wishlist for template **form**
- Telephone interviews with Art. 16 Committee members, focusing primarily on the wishlist for template **content** – i.e. the good policy and programme examples to illustrate the template's use

# Development - empirical

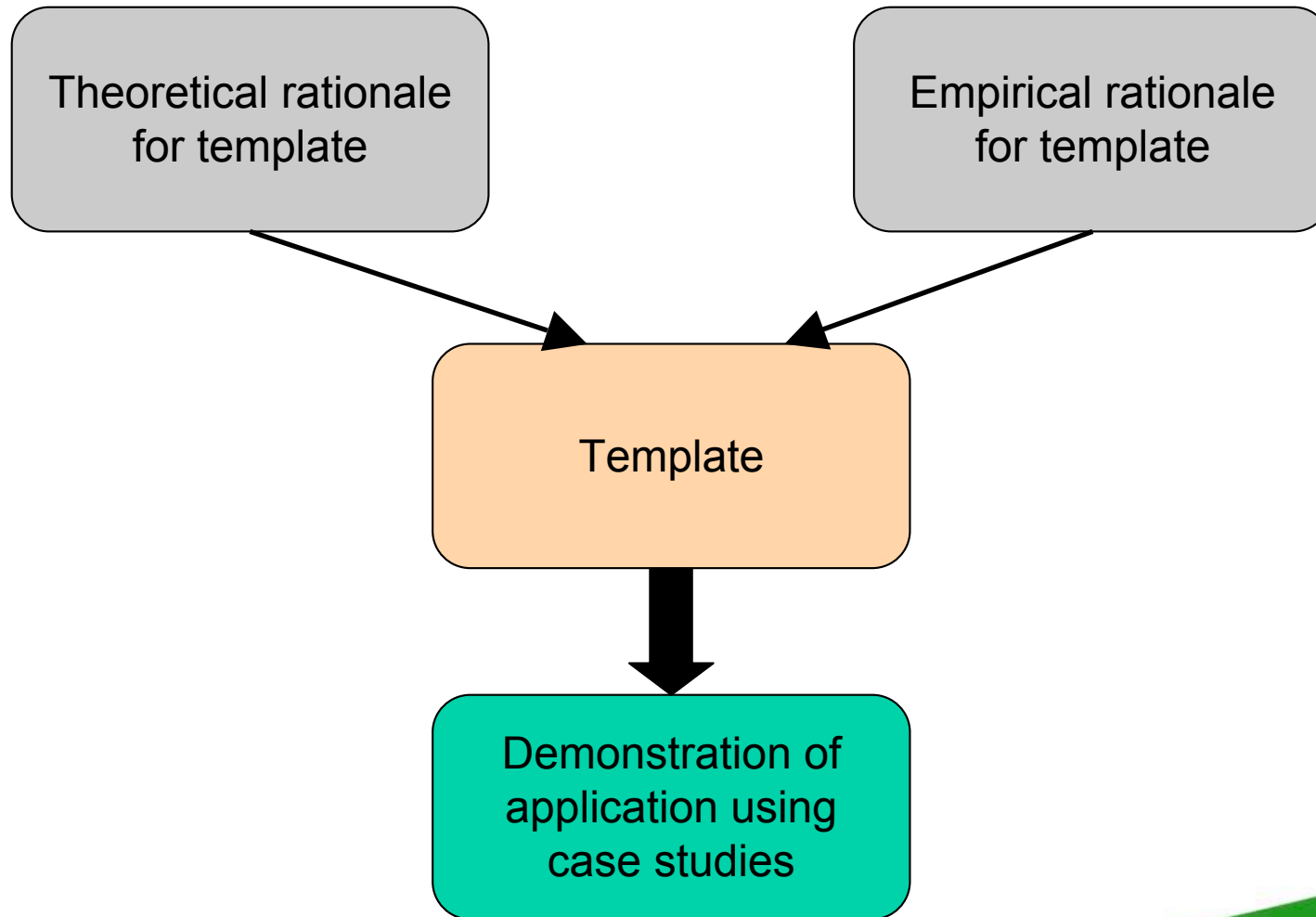
A selection of findings from the interviews:

- The PHARE programme was very helpful in the early development of energy demand calculation methods
- Many Member States intend to adopt the official calculation methodology for bottom-up and top-down measurement of energy savings once it becomes available (one citing its own method as “different and strange”), whilst some others are highly confident in their existing, national calculation methodology
- Some Member States with a devolved regional responsibility for energy efficiency require more administrative effort to develop a NEEAP
- It is possible that short-term policies that can be implemented quickly are also less cost effective, for example introducing subsidies with immediate effect, compared with building codes and standards
- The template probably has more value to the newer states than those with established systems. Introducing another document risks creating more bureaucracy and therefore the plan must be kept short

# Development – empirical

- Mailout of questionnaire about template to Art. 14 (EPBD) and Art. 16 (ESD) Committees, focusing primarily on the wishlist for template **form**
- Telephone interviews with Art. 16 Committee members, focusing primarily on the wishlist for template **content** – i.e. the good policy and programme examples to illustrate the template's use
- **Auxiliary benefit – raised awareness in both Committees of our work**

# Development – template



# Development – template

- Three main parts
- 1. Overview part
  - a. Summary of objectives and targets, broken down by sector

# Development – template

Introduction	Public	Residential	Commercial	Total
<b>Statement of commitment to energy saving target</b>	<i>Written statement giving an overview of the programmes.</i>			
<b>Saving target for first NEEAP</b>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>
<b>9%, minimum target required by ESD</b>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>
<b>Overall saving target and full energy saving potential by 2020</b>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>
<b>Savings from additional programmes</b>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>
<b>What is the current/baseline energy consumption</b>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>	<i>(GWh)</i>

# Development – template

- Three main parts
- **1. Overview part**
  - a. Summary of objectives and targets, broken down by sector
  - **b. Summary of how policies and programmes fulfil EPBD and ESD requirements**

# Development – template

Compliance with Energy Performance of Buildings Directive	Legislation
§3 – Adoption of a methodology	
§4 – Setting of energy performance requirements	
§5 – New buildings	
§6 – Existing buildings	
§7 – Energy performance certificates	
§8 – Inspection of boilers	
§9 – Inspection of air conditioning systems	
§10 – Independent experts	
§13 – Review and adaptation of the framework	
§15 – Transposition	

Compliance with Energy End-use Efficiency and Energy Services Directive	Existing programmes/legislation	Planned programmes
§4 – General target		
§5 – Energy end-use efficiency in the public sector		
§6 – Energy distributors, distribution system operators and retail energy sales companies		
§7 – Availability of information		
§8 – Availability of qualification, accreditation and certification schemes		
Etc...		

# Development – template

- Three main parts
- 1. Overview part
  - a. Overall objectives for building sector
  - b. Summary of how policies and programmes fulfil EPBD and ESD requirements
- 2. Policies/programmes part

# Development – template

Building energy efficiency programme or policy (required for each)	
a. Name	Name of the programme
b. Type of programme	To follow the same broad categorisation of policies and programmes as outlined in <b>Error! Reference source not found.</b>
c. Buildings sector(s) it affects	Public/residential/commercial
d. Other, non-building sectors it affects	Potentially transport and/or industrial
e. Historical background to programme	If provided, should be in appendix
f. Measures applied	Whether it is technology and/or information based
g. Barriers tackled	If provided, should be in appendix
h. Potential energy savings	The amount of energy that could potentially be saved from the measures this programme promotes (both technical and cost-effective)
i. Expected/actual energy savings	Expressed in GWh; will overlap with timeframe (i.e. how much it will save by different dates); must include how much it will save in 3, 6, 9 years time and how much it will save by 2020
j. Target end-users	Which groups of end-users pocket the gains from the energy savings, eg socio-economic group, type of business
k. Full cost benefit analysis	If provided, should be in appendix
l. Programme cost	Must be a standardised indicator – Euro/kWh saved
m. Bearers of cost	Which key stakeholders bear the cost of installing the measures and running the programme
n. Timeframe	Start date, duration of programme. Should also reflect key dates: 3 years, 6 years, 9 years after ESD implementation
o. Wider context/auxiliary benefits	If provided, should be in appendix; should include reporting on e.g. job creation and health improvement, and who benefits
p. Examples/case studies	If provided, should be in appendix; more important for the 2 <sup>nd</sup> and 3 <sup>rd</sup> NEEAP
q. Reasons alternative programmes were rejected/unsuitable	If provided, should be in appendix
r. Legislative framework	What primary and secondary legislation (if any) has been introduced for the programme

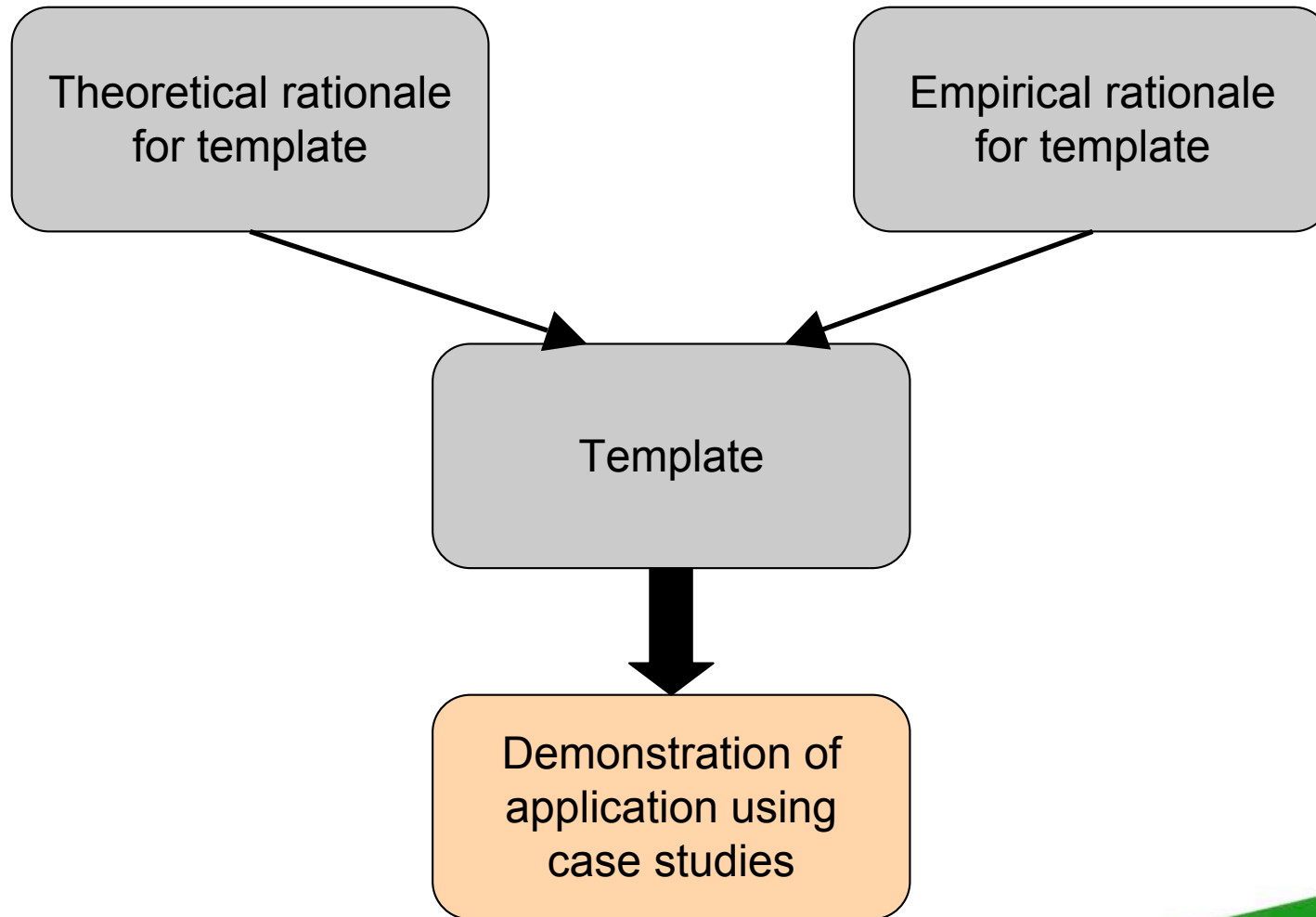
# Development – template

- Three main parts
- 1. Overview part
  - a. Overall objectives for building sector
  - b. Summary of how policies and programmes fulfil EPBD and ESD requirements
- 2. Policies/programmes part
- 3. Appendix

# Development – template

- The appendix should contain, programme by programme, the non-essential information listed in Part 2 (i.e. the items not in bold), which Member States wish to report on – such as:
  - e. Historical Background
  - g. Barriers it tackles
  - k. Full Cost benefit analysis
  - o. Wider and auxiliary benefits
  - q. Rejected alternative programmes and reasoning

# Development – template



# Development – application

- To make template real and accessible
- Choice of good examples of policies and programmes to cover different types
- Applied in template
- Based on concept that a good building NEEAP requires a comprehensive suite of policies and programmes

# Development – application

	Financial		Non-financial	
	Push	Pull	Push	Pull
<b>Pre-investment/ implementation</b>	<b>UK Climate Change Levy (insofar as it applies to the commercial sector)</b>	support of R&D, technical improvements, piloting and demonstration	<b>Danish Building Regulations</b>	<b>Danish Building Energy Certification; Austrian klima:aktiv</b>
<b>Investment/ implementation</b>	energy taxes, product taxes	<b>German KfW-CO<sub>2</sub>-Gebäudesanierungsprogramm</b>	<b>British Energy Efficiency Commitment</b>	n/a
<b>Post-investment/ implementation</b>	energy taxes	Differentiated energy tariffs	Requirement for updating building energy labels regularly	maintenance support and advice
<b>I n d i r e c t programmes</b>	energy taxes	n/a	n/a	<b>UK Practical Help; part of German KfW-CO<sub>2</sub>-Gebäudesanierungsprogramm</b>

# Development – conclusions going forward

- Many aspects of the template are easily transferable to other sectors covered in the NEEAPs
- NEEAP template needs to be sufficiently flexible to accommodate a wide variety of policies and programmes, whilst ensuring consistency
- The template will need to evolve over time (for subsequent NEEAPs) in line with the application of consistent energy-savings measurement in the Member States – following the full application of consistent calculation methodologies
- NEEAPs must not lose sight of energy saving targets beyond the nine years covered by the ESD, in particular the 20% energy saving by 2020 outlined in the European EEAP
- There are still a very wide range of indicators used to report on different policies and programmes for energy saving in buildings – as is evident from the examples. The NEEAP template and calculation methodology development should work to encourage consistent indicators and reporting, so contributing to the development of a market for energy efficiency and energy services
- Evaluation of NEEAPs needs to be carried out carefully, taking into account different socio-economic and cultural factors in the Member States

- Thank you!
- You can visit [www.euroace.org/template.htm](http://www.euroace.org/template.htm) to find out more