'Building' Energy Efficiency Action Plans

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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

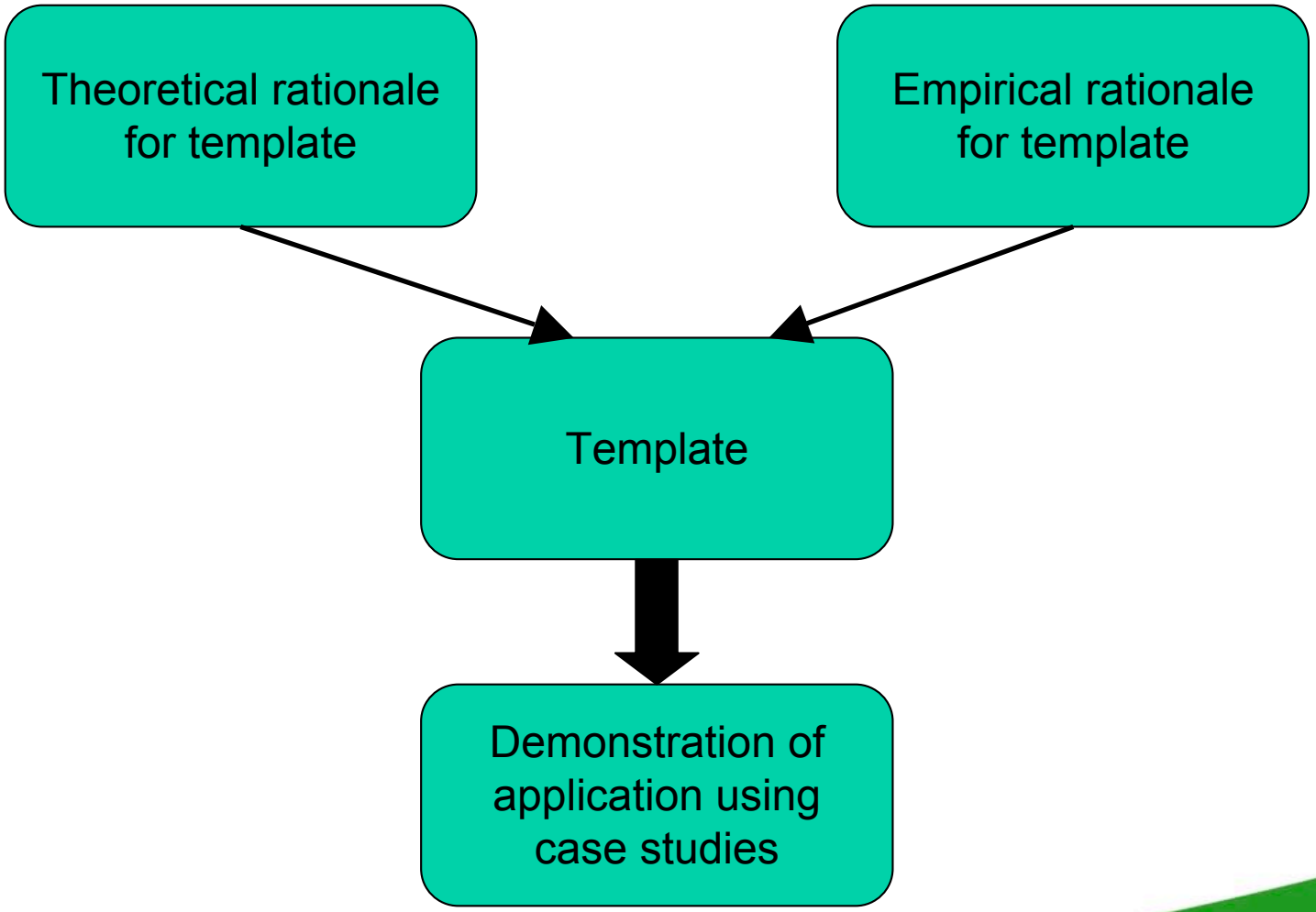
Background

- 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

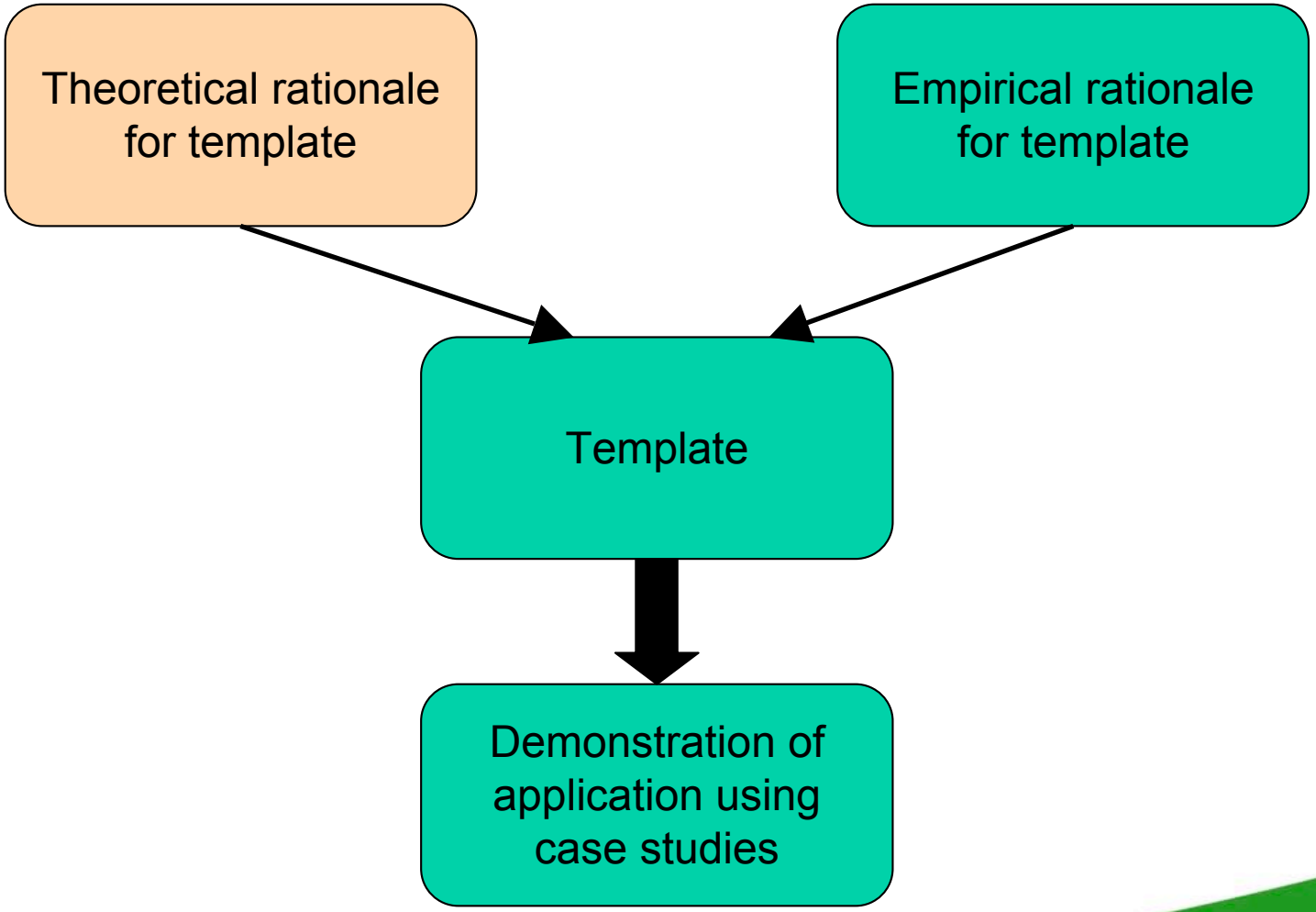
Background

- 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


Theoretical rationale for template
Empirical rationale for template
Template
Demonstration of application using case studies

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***
Information and education All groups (occupiers, owners, builders, and designers) need appropriate information so they are empowered to make better decisions.	**Components** • Mass and glazing optimisation design guides for buildings. • Water heating technology programme, including solar. • Energy labelling and MEPS development. • High efficiency domestic luminaires design competition and development.	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.
	Whole Building • Instigate programme with aim of developing national Home and Building Energy Rating Schemes (HERS and BERS). • Energy efficiency and renewables information gathering and dissemination programmes eg, HEEP and BEEP, energy benchmarking studies.	Pilot and trial by 2002/03, implement 2005. Ongoing.	**EECA**, Environment Canterbury (Pilot HERS), BRANZ, industry stakeholders.
Standards Voluntary and mandatory Standards to establish minimum performance levels and best practice targets for design and operation.	**Components and Design** • Develop better and best practice design standards and guides. • Commercial buildings and building services design support. • Develop a standard or a code of practice to define good practice in the commissioning and operation of building systems. • Develop a new standard for insulation materials and installation.	Completed by 2004/05. Ongoing design - implement from 2004. Development by 2004. Development by 2003.	**EECA**, BRANZ, SNZ, BIA, building industry stakeholders.
Minimum mandatory energy standards are required for health, safety, comfort and economic efficiency. Changes to the Code could improve new buildings at no additional lifecycle cost.	**New Zealand Building Code** • 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.	Review every five years starting 2003.	**BIA**, EECA, BRANZ, SNZ, building industry stakeholders.

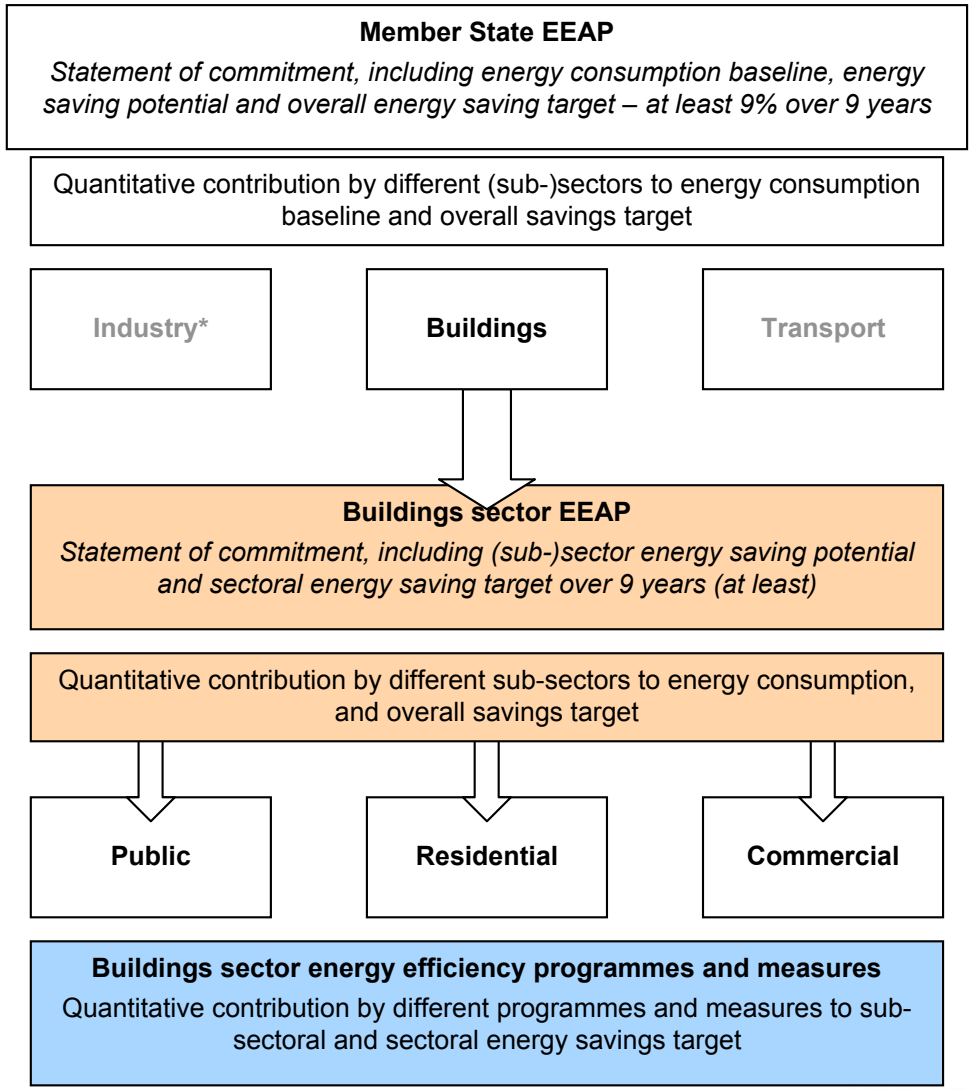
Implementation Support
Seventy percent of housing stock was built before the first minimal codes. These houses are often damp and cold and should be improved for health reasons.
All existing commercial buildings are pre New Zealand Building Code H1 and should be assessed and upgraded.
	• Residential grants funding supporting two current transitional programmes:
	  • Sustainable market-based activities in the residential sector and
	  • Socially focussed residential retrofit programme to assist energy upgrades on lower socio-economic housing.
	• Further development of residential grants programmes
	• Housing New Zealand efficiency retrofit programme and other initiatives.
	• Commercial buildings commissioning and maintenance skills upgrading.
		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.

Research Research to underpin energy initiatives.	• Health and Energy in Residential Buildings Research Project – a study of 1400 houses to determine health impacts of poor energy efficiency.	Ongoing - completed by 2003/04.	**Wellington School of Medicine**, EECA.

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

Building energy efficiency programme or measures (required for each)	
Name	*Name of the programme or measure*
Historical background to regulation	*Links back to lessons from current efforts and describes how targets and programmes have evolved to this stage*
Barriers identified What barriers it overcomes	*The barriers are often those which the ESD and EPBD were designed to overcome*
Which sector it targets/effects	*Where the savings are achieved e.g. buildings, tertiary sector, industry*
What measures are proposed	*Measures which may be used such as those listed in Annex III of the Directive (see* ***Error! Reference source not found.*** *)*
How much it will save – who pockets the savings	*The indicative target for the programme, measured in energy and carbon*
Who gains from the savings	*Also who directly benefits from the improvements (often the target sector)*
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*
What are the potential savings (technical/cost-effective)	*The absolute best case scenario assuming 100% take up with the most efficient technology*
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*
Who will bear the cost	*Which departments/stakeholders are affected*
Examples/case studies	*Specific examples are useful to illustrate a programme but are more often uses to engage the general public*
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*
Timeframe	*When the legislation will be in place and savings are expected to accrue*
Method for evaluating result	*Bottom up or top down methodology*

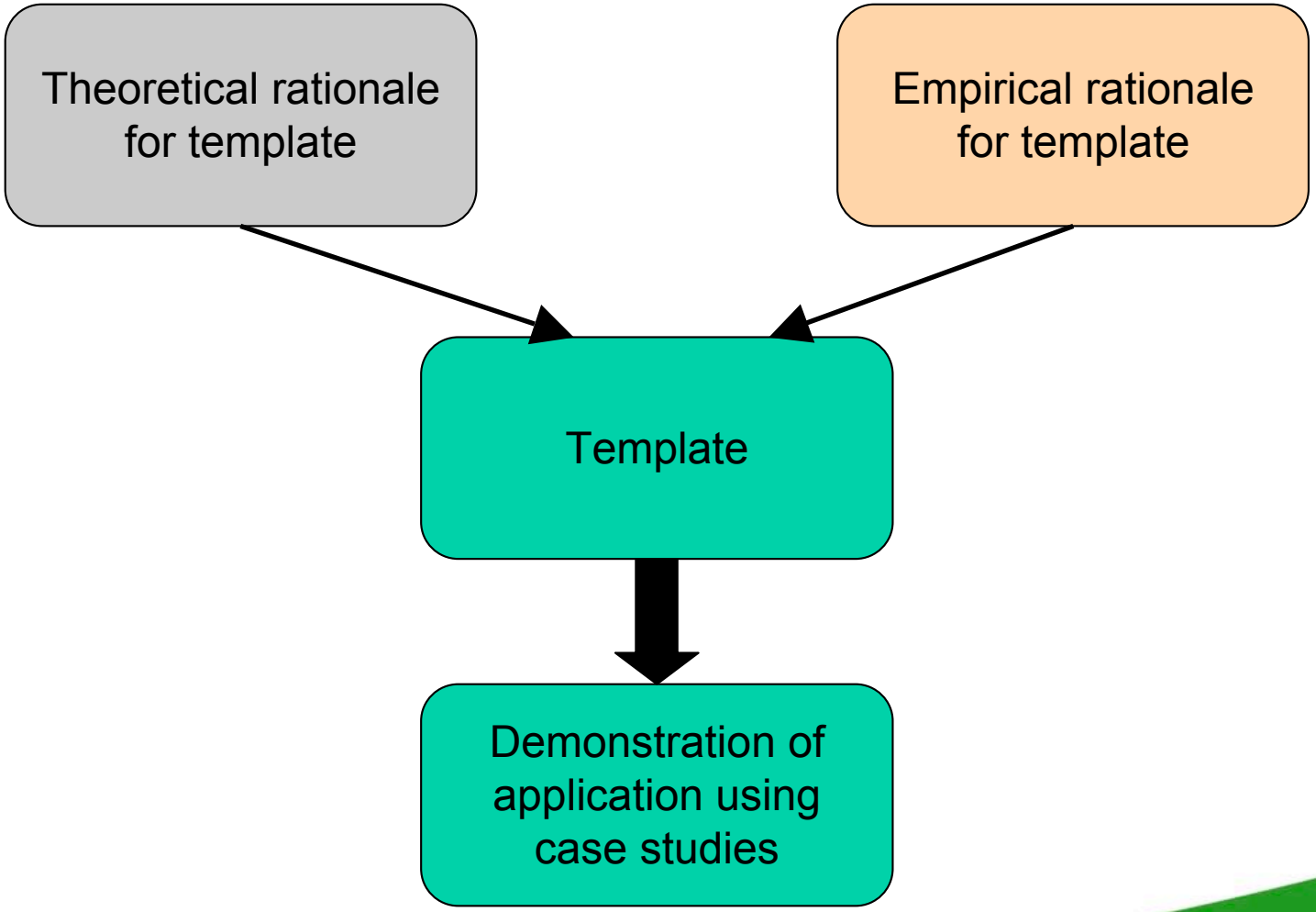
Development – theoretical

- 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**
Pre-investment/ implementation	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
Investment/ implementation	energy taxes, product taxes	Investment grants, financing, tax relief	White certificates or Energy Efficiency Commitment	n/a
Post-investment/ implementation	energy taxes	Differentiated energy tariffs	Requirement for updating building energy labels regularly	maintenance support and advice
Indirect programmes	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

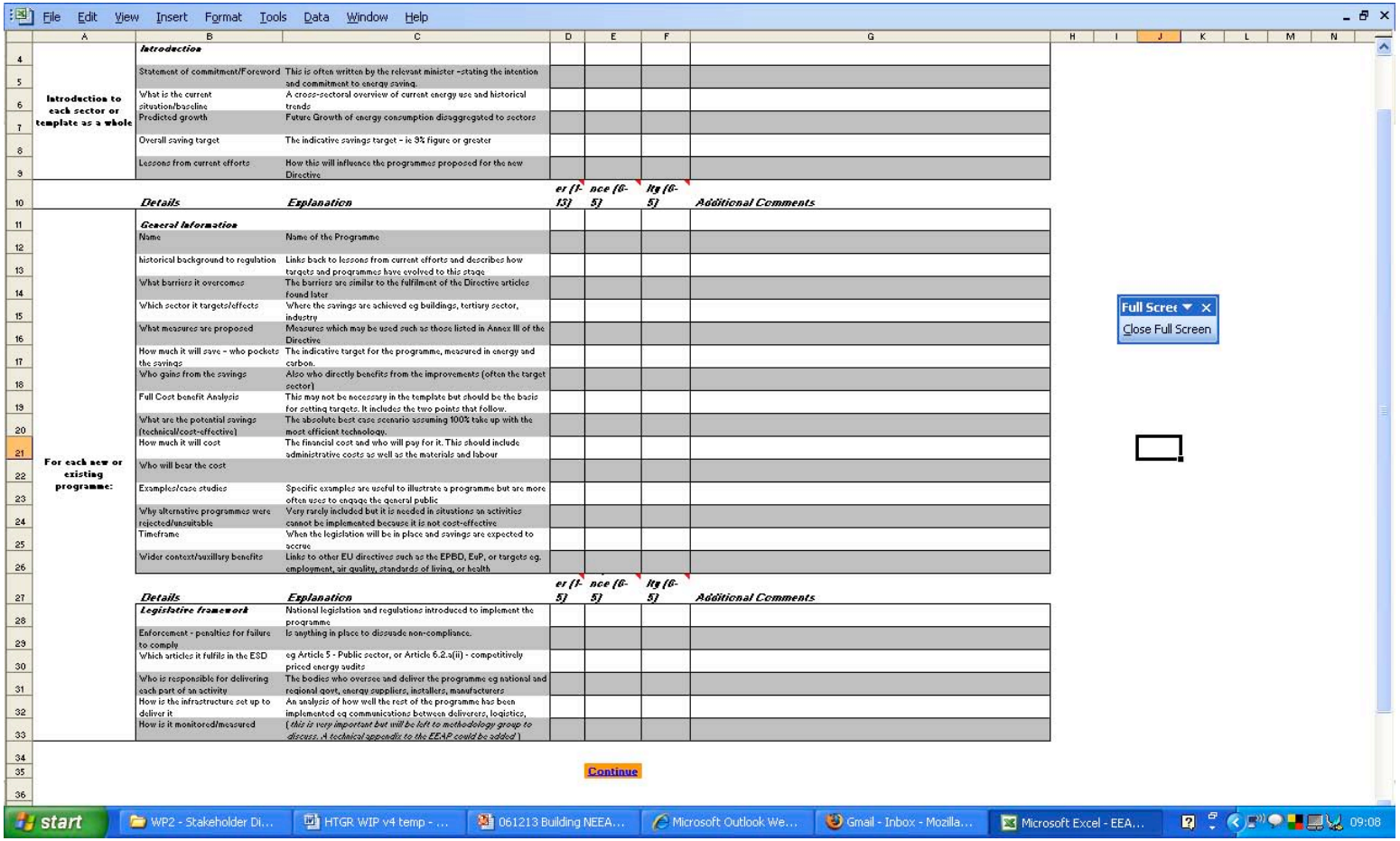
Development – empirical



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



EuroACE

Development - questionnaire

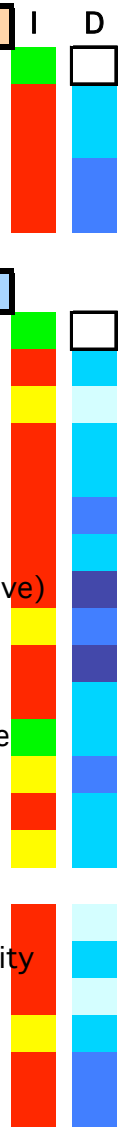
Introduction

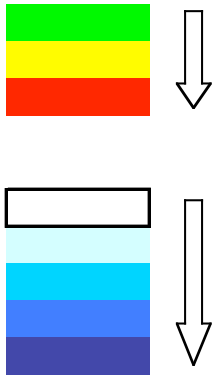
Statement of commitment/Foreword
What is the current situation/baseline
Overall saving target
Predicted growth
Lessons from current efforts

General Information

Name
Which buildings sector it targets/affects
Historical background to programme
What measures are proposed
What barriers it overcomes
How much it will save – who pockets the savings
Who gains from the savings
What are the potential savings (technical/cost-effective)
Full Cost benefit Analysis
How much it will cost
Who will bear the cost
Why alternative programmes were rejected/unsuitable
Examples/case studies
Timeframe
Wider context/auxillary benefits

Legislative framework
Who is responsible for delivering each part of an activity
Which articles it fulfils in the ESD
Enforcement - penalties for failure to comply
How is the infrastructure set up to deliver it
How is it monitored/measured





increasing importanc

increasing difficulty

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

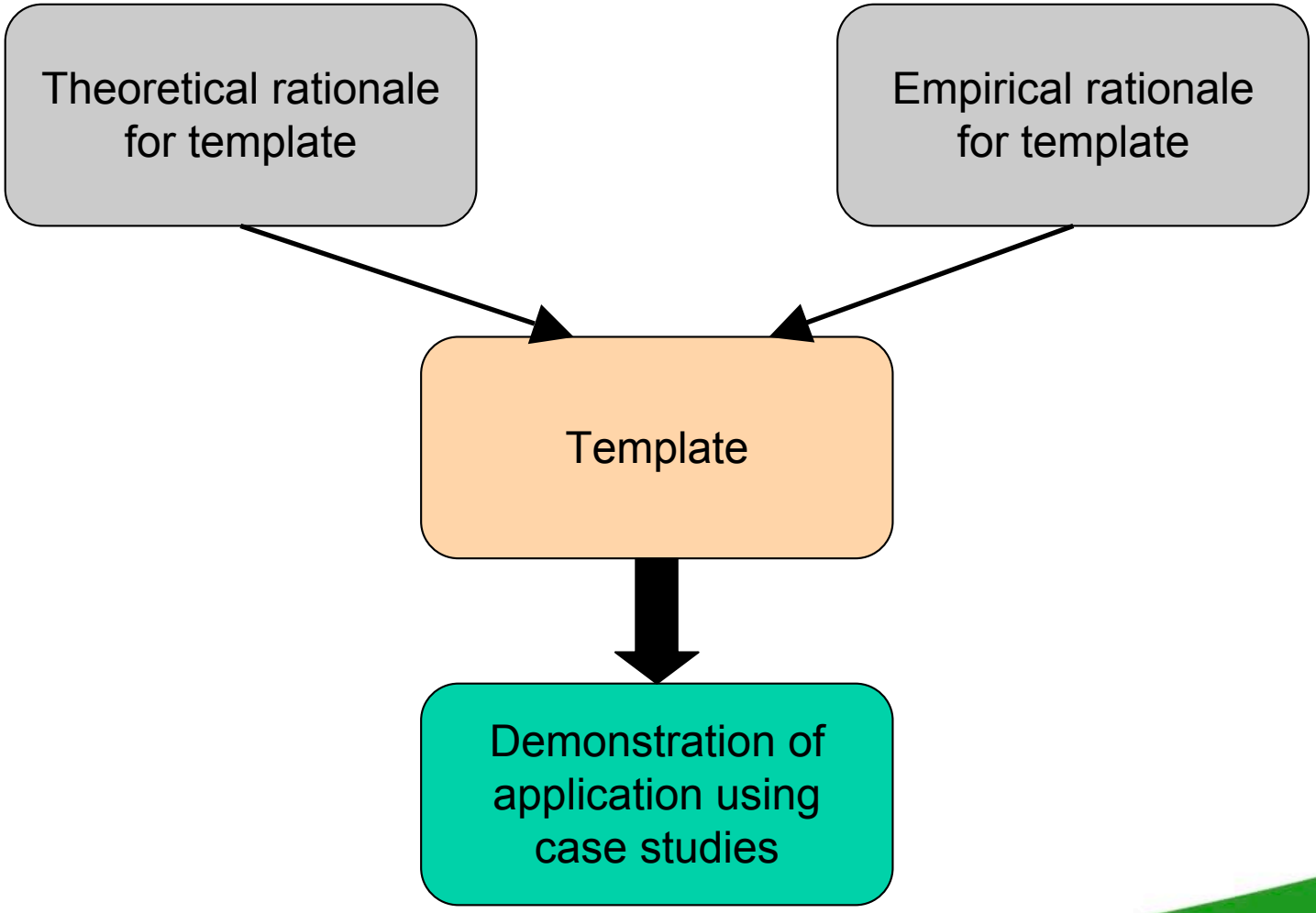
A selection of findings from the interviews:

- 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
Statement of commitment to energy saving target	*Written statement giving an overview of the programmes.*			
Saving target for first NEEAP	*(GWh)*	*(GWh)*	*(GWh)*	*(GWh)*
9%, minimum target required by ESD	*(GWh)*	*(GWh)*	*(GWh)*	*(GWh)*
Overall saving target and full energy saving potential by 2020	*(GWh)*	*(GWh)*	*(GWh)*	*(GWh)*
Savings from additional programmes	*(GWh)*	*(GWh)*	*(GWh)*	*(GWh)*
What is the current/baseline energy consumption	*(GWh)*	*(GWh)*	*(GWh)*	*(GWh)*

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* ***Error! Reference source not found.***
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 2nd and 3rd 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*

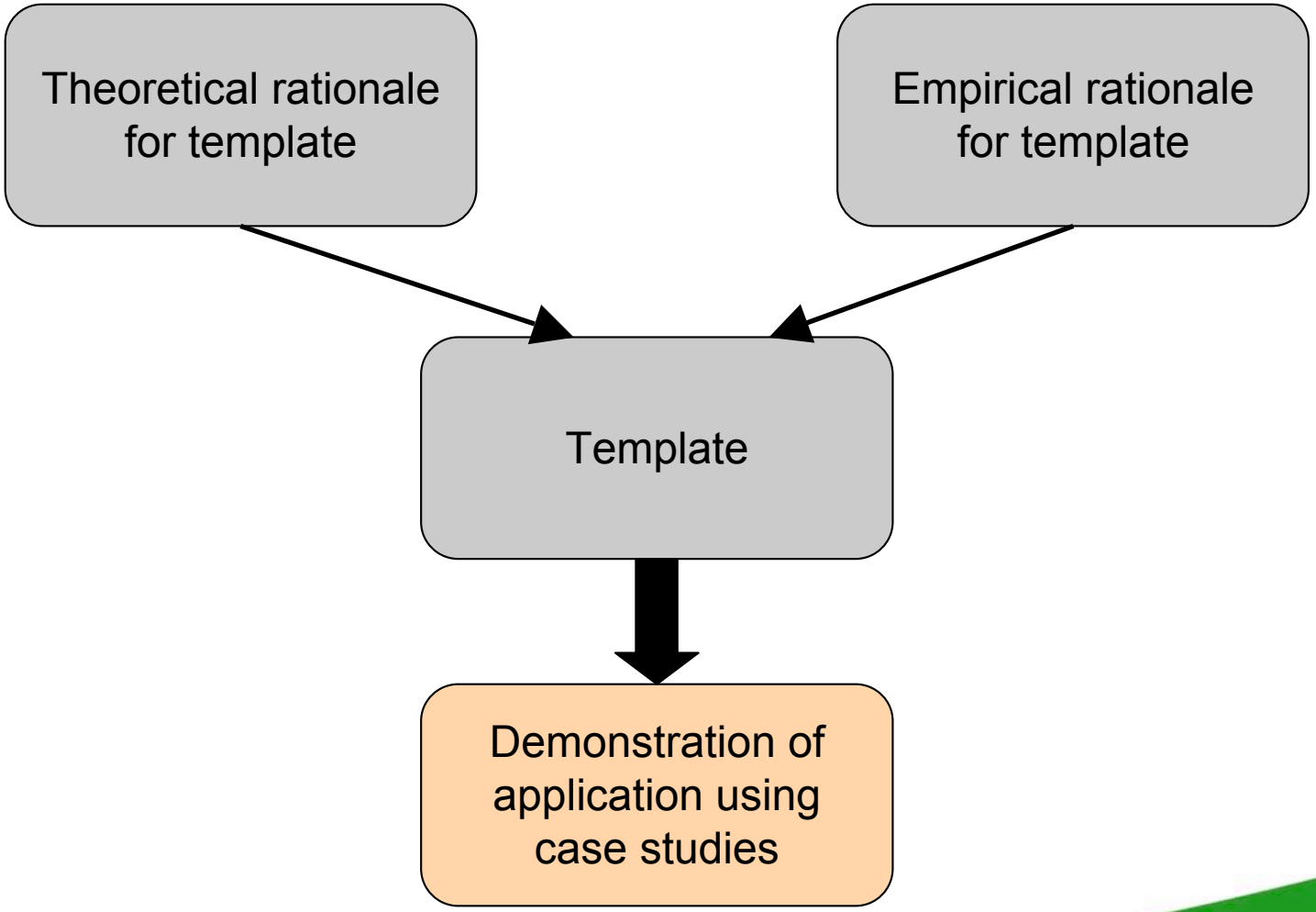
Development – template

- 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**
Pre-investment/ implementation	**UK Climate Change Levy (insofar as it applies to the commercial sector)**	support of R&D, technical improvements, piloting and demonstration	**Danish Building Regulations**	**Danish Building Energy Certification; Austrian *klima:aktiv***
Investment/ implementation	energy taxes, product taxes	**German *KfW-CO_2-Gebäudesanierungsprogramm***	**British Energy Efficiency Commitment**	n/a
Post-investment/ implementation	energy taxes	Differentiated energy tariffs	Requirement for updating building energy labels regularly	maintenance support and advice
Indirect programmes	energy taxes	n/a	n/a	**UK Practical Help; part of German *KfW-CO_2-Gebäudesanierungsprogramm***

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 to find out more