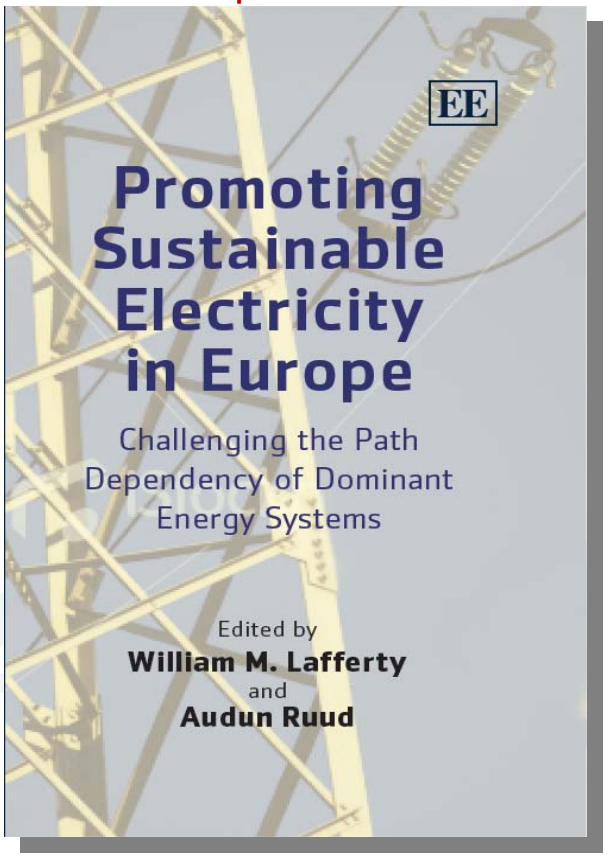
The SUSTEN Project

- Initiated by Programme for Research and Documentation for a Sustainable Society (ProSus), University of Oslo (to be part of Sintef Energy Research from 1/1-09)
- Financed primarily by the Research Council of Norway

- In cooperation with seven major research institutions in Europe:

- **FI: Finnish Environment Institute (SYKE)**
- **SE: Stockholm Environment Institute (SEI)**
- **DK: Copenhagen Business School (CBS)**
- **NL: Centre for Clean Technology and Environmental Policy (CSTM), UTwente**
- **IE: Cleaner Production Promotion Unit (CPPU), UCork**
- **AU: Technical University Graz (TUG)**
- **ES: Department of Political Science, (UAM), Madrid**



The goals of the EU RES-E directive (2001):

Overall goals for EU:

- **Renewable Energy Sources (RES) to constitute 12% of overall energy consumption in EU15 in 2010**
- **RES to constitute 22,1% of "total Community electricity consumption" by 2010**

Goals for Member States:

- **"Indicative targets" for Member States (MS): "percentage of electricity consumption"** (in EU25)
- **"Practical requirements" for MS: "designed to ensure stable investment conditions for electricity from RES" (Arts. 4-7 of RES-E directive of 2001)**
  - **the implementation of attractive support schemes, which should be as efficient as possible**
  - **the removal of administrative barriers**
  - **the guarantee of fair grid access**
  - **the issuing of "guarantees of origin"**

The basic design of the SUSTEN project:

- **Focus on the implementation of the RES-E directive, with emphasis on lessons for:**
  - **security of EL supply;**
  - **Kyoto targets and climate-change;**
  - **job-creation and regional development;**
  - **governance for sustainable production and consumption.**
- **Documentation and comparative analysis of national strategies, governing mechanisms, action plans and policy instruments for promoting RES-E – modes of RES policy implementation in the European Union.**
- **Analytic focus on the contextual variables conditioning the functioning of the dominant implementation model: technology development + market penetration.**

Builds on a thorough review of existing EU Research projects/websites of direct relevance for SUSTEN

[All accessible from the REACT.NOVEM website: http://www.react.novem.org/]

Key examples:

- **ManagEnergy:** http://www.managenergy.net/

- **Renewable Energy Partnerships:** http://europa.eu.int/comm/energy/res/renewable_energy_partnerships/index_en.htm

- **Ener-IURE Project: http://www.jrc.es/cfapp/eneriure/welcome.html**

- **PRETIR Project: http://www.greenprices.com/eu/doc/pretireureport.pdf**

- **REMAC 2000: http://www.renewable-energy-policy.info/remac/**

- **MITRE Project: http://mitre.energyprojects.net/**

- **REACT: http://www.react.novem.org/**

- **ElGreen and *Green-X* Projects: http://www.green-x.at**

- **REALISE-Forum: http://www.realise-forum.net**

COMMON FEATURE OF ALL PROJECTS:

EMPHASIS ON A STANDARDIZED "TECHNOLOGY-DEVELOPMENT / MARKET-PENETRATION" MODEL

Key examples – I. REMAC 2000:
Foundation project for *Renewables for Power Generation* (2003: IEA-OECD)

Identifies "*Focal Points for Policy Intervention in Renewable Energy Technologies*":

Opportunities for improvement of technical and economic performance	**Basic research**	**Applied research**	**Market introduction**	**Sustained market**
Cost reduction through R&D				
Performance increase				
Econ. of scale (components size)				
Econ. of scale (manufacturing volume)				
Econ. of scale (plant size)				
Economy from market system				

Major REMAC conclusions:

"This virtuous cycle functions in a different manner for each of the renewable technologies, based on the specific maturity of the technology and how far it has progressed in markets. These differences between the six renewable technologies are crucial. . . . Thus, while policy makers should recognise the broad similarities of renewables, they must also realise that to affect market growth and competitiveness, they need to address specific technologies in the context of local conditions." (p. 14)

"The technology 'learning curves' [presented in the book] translate the complex relationships among technology, industry and market into a curve of declining costs. However, these curves only interpret the input and output of the learning system; they do not explain the process going on within it." (p. 15)

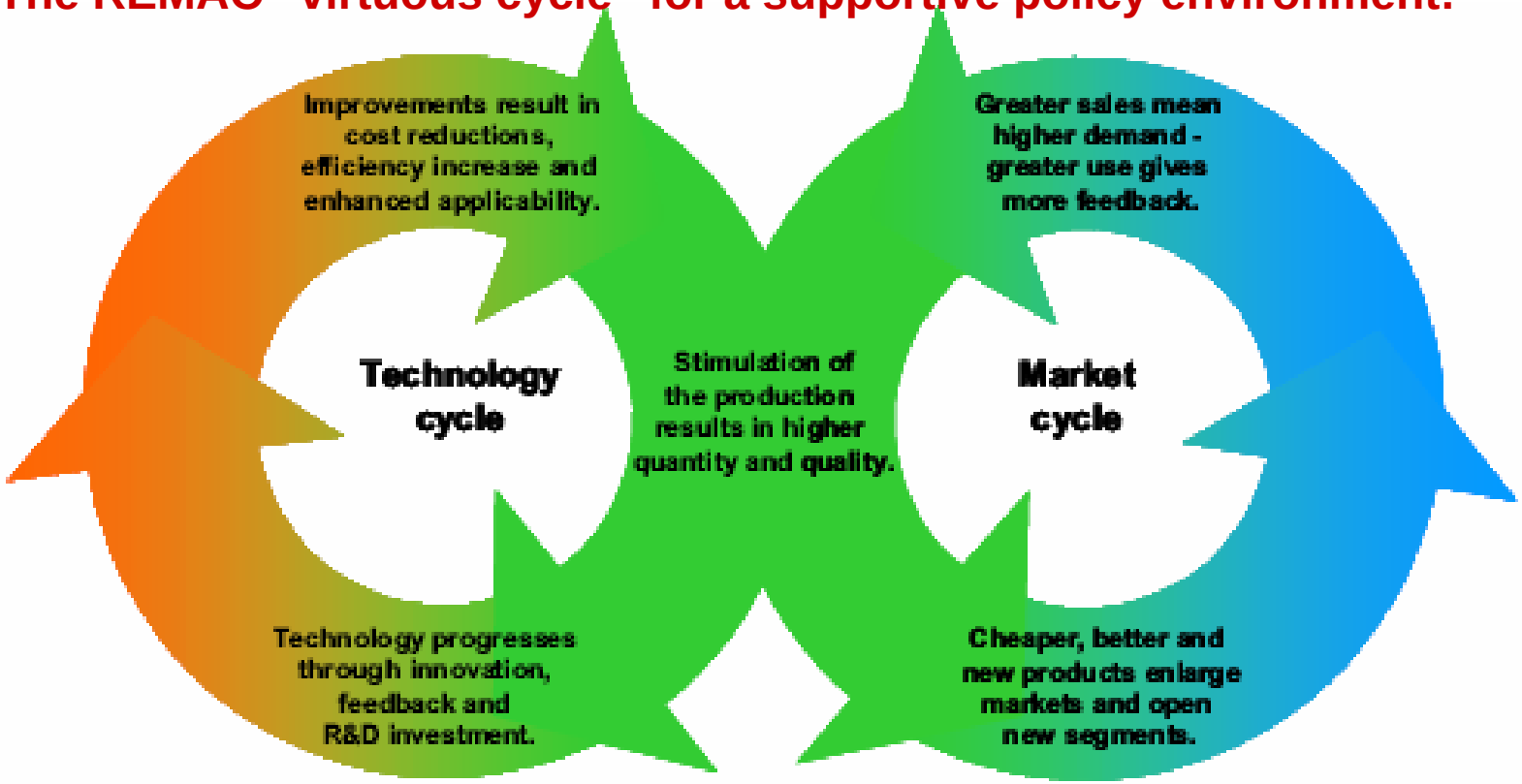
Example II: EEA list of barriers and obstacles to RES

Barriers and obstacles to renewable energy deployment	
Barrier	**Obstacle**
Political	Lack of political motivation to support the market initiatives needed for the development of renewables
Legislative	Lack of an appropriate legal framework and legislation at EU and national levels that support the development of renewables Difficulties with linking electricity or heat from renewables into the existing electricity and heat networks
Financial	Lack of appropriate financing for long-term financial benefits
Fiscal	Renewable energy technologies suffer from distorted competition from conventional energy sources (e.g. coal, nuclear) in terms of final end-user prices
Administrative	Lack of practical support at the regional and local level to stimulate development of renewable energy projects
Technological	Technological obstacles related to research, development and demonstration
Information, education and training	Lack of awareness of the potential and possibilities for renewables

Source: (EEA 2001):"Renewable energies: Success stories", Environmental Issue Report No. 27, p. 27

Analytic Point of Departure

The REMAC "virtuous cycle" for a supportive policy environment:



Source: Figure 1, *Renewables for Power Generation* (2003: IEA-OECD, p. 14

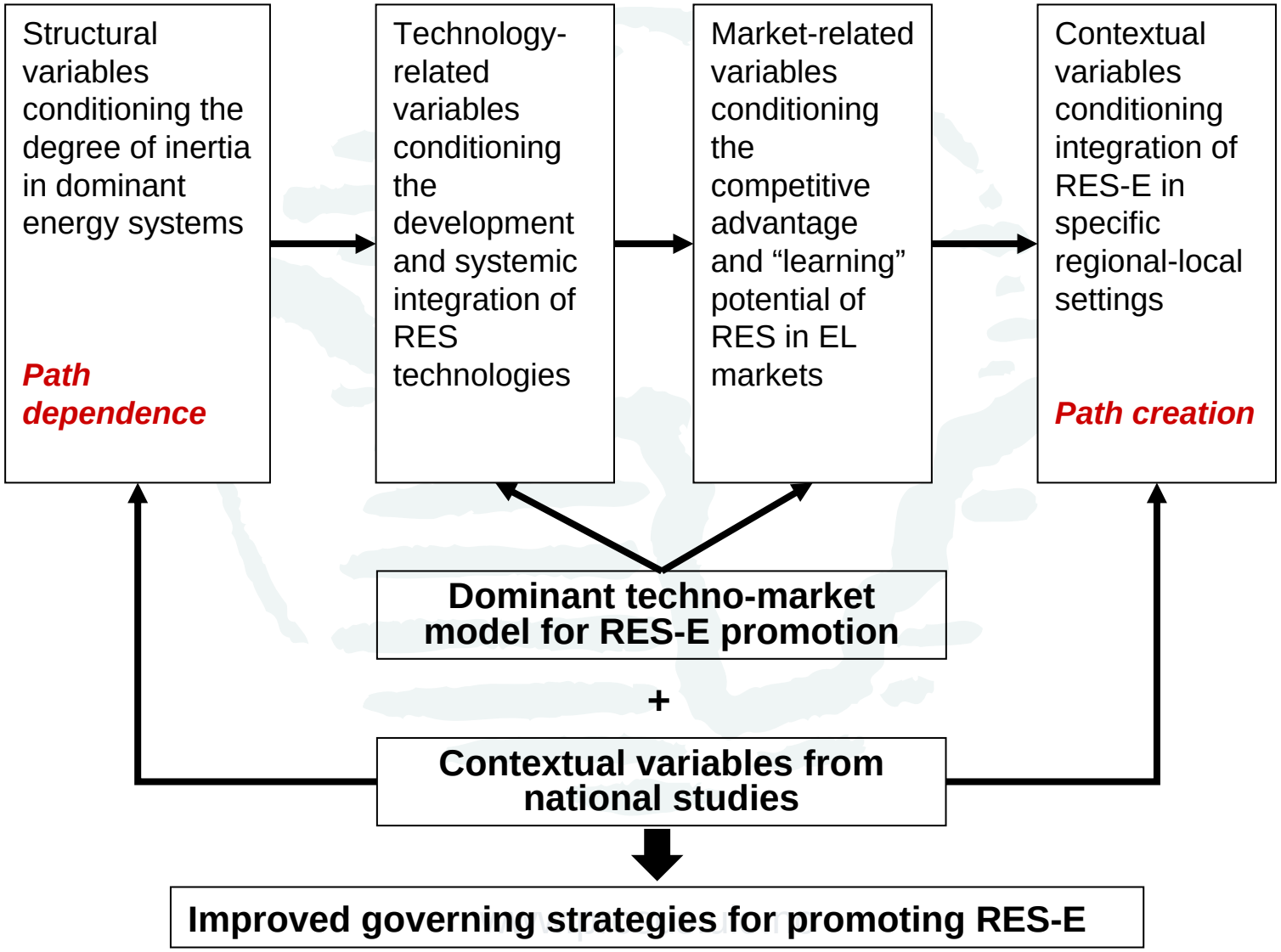
Summary formulation of SUSTEN aims:

- **Putting current knowledge on initiatives for promoting RES-E into a broader perspective of structural barriers and instrumental prospects.**
- **Highlighting necessary supplemental variables for understanding the implementation problematic: variables that condition existing models for promoting technological breakthroughs and market learning.**
- **Emphasizing: (1) path-dependency barriers to achieving RES-E targets in each country (structural conditioners), and (2) regional-local contextual variables that either hinder or enhance the actual implementation of RES-E technologies (transition conditioners).**
- **Placing the challenge of achieving RES-E goals and targets in a broader context of national strategies for sustainable development, with a particular focus on the need to integrate policies for innovation with policies for sustainable production and consumption.**

Original working title of final report:

"Breaking the Grid Lock: Promoting Sustainable Electricity in Europe"

The expanded SUSTEN model:



I. General conclusions on the "techno-market bias" to RES-E promotion:

- Such a bias clearly exists – and SUSTEN is unique in documenting the situation
- No similar comparative analysis of RES-E promotion is currently available
- The national studies specifically illustrate how the promotion of RES-E is directly channelled and conditioned by the inertia and interests of the "dominant energy system" (DES) in each country
- "Path dependency" is a necessary concept for understanding why and how specific RES-E technologies are phased into the energy mix – or not!
- Path dependency is also a necessary point of departure for developing context-sensitive variants of techno-market promotional instruments – "path creation"
- "The Medium is the Message" – knowledge produced by the SUSTEN approach is more effective knowledge for realizing change.
- Specific key lessons to illustrate this are highlighted in the study – but the individual case studies must be consulted and compared to gain full benefit from the project.

II. General conclusions on the role of the EU Commission (CEC) in promoting RES-E in Europe:

- The CEC plays a crucial role in the attempt to maximize RES-E outcomes from techno-market promotional schemes:
  - Research and development: Overcome technical barriers
  - Standardize competition: Remove market barriers
  - Standardize rules and regulations: Remove national and regional administrative barriers
  - Set standardized targets, time-lines, benchmarks: Stimulate competitive initiatives

- **<u>But</u> – An overemphasis of these aspects leads to biased steering and a sub-optimal knowledge-base for change**

II. General conclusions (cont.) :

The bias of the CEC approach comes to light in the SUSTEN study through:

- Discrimination against contextual research and the effects of path dependency in the Intelligent Energy Europe Programme (IEE)
- Normative-conceptual bias in official guidelines, action plans, priorities, etc. (For example in the “Eight main areas of action on renewable electricity to be ‘immediately developed’ within the EU/EEA” (CEC evaluation, 2007; Box 10.1, Lafferty & Ruud)
- Surprisingly non-transparent and questionable usage of empirical materials for comparative assessments and rankings
- Counter-productive effects related to an over-emphasis on questionable targets and standards of achievement (clearly reflecting Karl Mallon’s (2006) “Myths, pitfalls and oversights” in RES policy formation)
- In sum: The political role of the EU Commission in promoting RES-E has (until the end of 2007 at any rate) been clearly biased toward the *standardizing values* of the Lisbon Agenda for “sustainable economic growth” – to the detriment of the *contextual values and concerns* (national, regional and local) of the Gothenburg Agenda for “sustainable development”.

SUSTEN results

Selective national figures for RES-E achievement

	Percent RES-E of total *El consumption (1990 – 2004)* IEA/OECD data		Percent RES-E achieved EU CEC data ("normalized")	Indicative target from RES-E Directive	Gap to be closed by 2010 EU CED figures	Gap to be closed by 2010 SUSTEN figures
	1990	2004	2005	2010	2005 > 2010	2004 > 2010
Denmark	2.8	29.9	27.3	29.0	+ 1.7 ☺☺	- 0.9
Finland	18.3	30.8	25.4	31.5	+ 6.1 ☺	+ 0.7
Netherlands	1.7	6.2	6.5	9.0	+ 2.5 ☺	+ 2.8
Sweden	56.9	51.8	52.0	55.2*	+ 6.1 ☺	+ 3.4
Spain	20.2	22.7	21.6	29.4	+ 7.8 ☺	+ 6.7
Ireland	5.8	6.0	8.0	13.2	+ 5.2 ☺	+ 7.2
Austria	75.0	67.0	57.5	78.1*	+ 20.6 ☹☹	+ 11.1
Norway	125.0	98.7	99.0	90.0		- 8.7

SUSTEN results

The case of Austria:

	Percent RES-E of total *El consumption (1990 – 2004)* IEA/OECD data		Percent RES-E achieved EU CEC data ("normalized")	Indicative target from RES-E Directive	Gap to be closed by 2010 EU CED figures	Gap to be closed by 2010 SUSTEN figures
	1990	2004	2005	2010	2005 > 2010	2004 > 2010
Austria	**75.0**	**67.0**	**57.5**	**78.1***	**+ 20.6** ☹☹	**+ 11.1**

- How is it possible to produce the differences in the estimated Austrian RES-E shares in 2004 versus 2005?
- Sweden rejected the initial CEC target of 60 %, and "negotiated" a new target of 55.2 % RES-E share of total El consumption.
- Why did Austria accept an indicative target of 78,1 per cent?
- Has the CEC ranking of Austria at lowest level of RES-E achievement in the EU-15* been discussed or had any impact on RES-E policies in Austria?

* together with France and Italy