

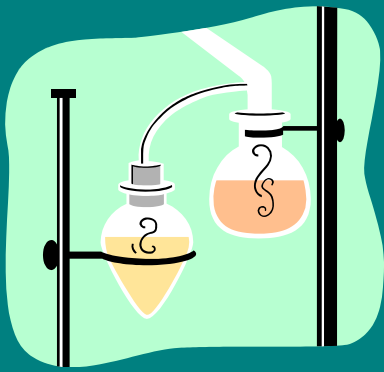
Role of Evaluation in Transforming Institutional R&D Frameworks

Lars Guldbrand, Swedish Energy Agency

Swedish Energy Agency

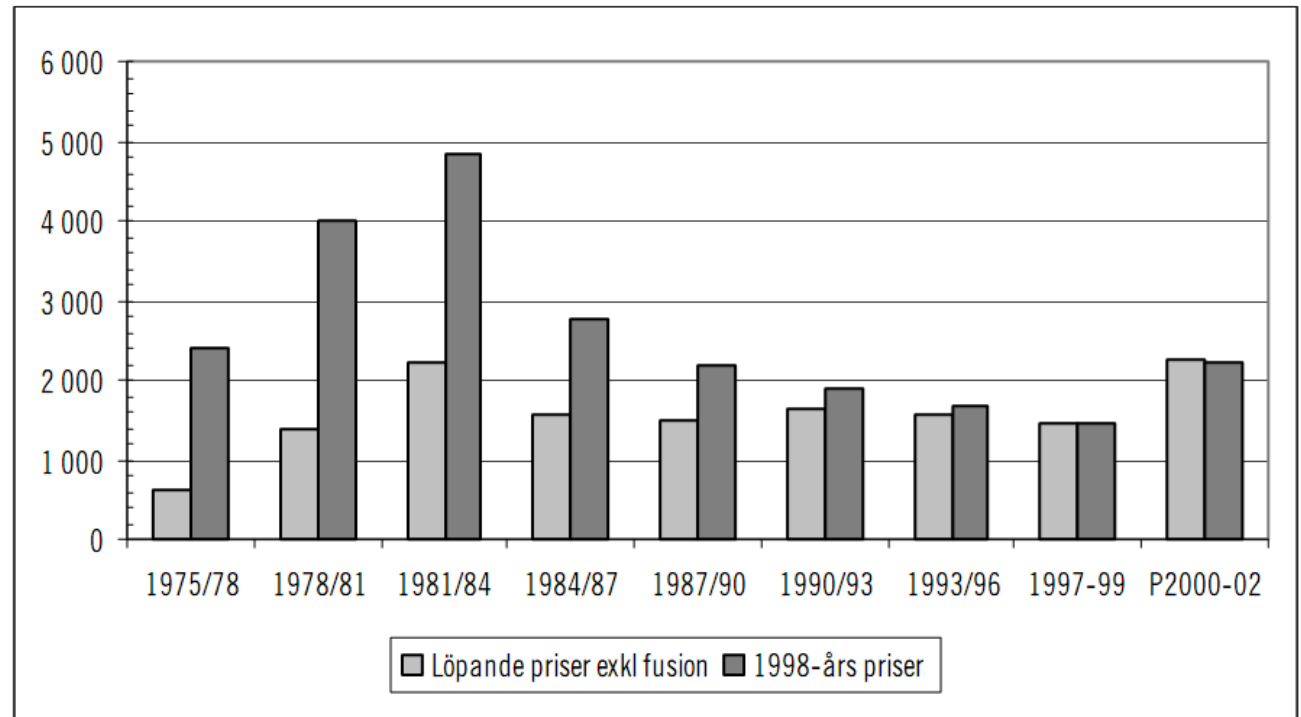
A sustainable energy system





Swedish Energy RD&D Programme since 1975

Different budgets, contents, instruments and organisations over the years



- 1975 Energy RD&D Programme initiated
- 1991 Energy policy decision
- 1992 Creation of FABEL Programme
- 1994 Appointment of Energy Commission
- 1997 Energy Policy Agreement across political block (S, V, C)
- 1998 Start of Longterm Energy Policy Programme 1998 - 2004
- 2001 Appointment of Commission for evaluation of Longterm Energy Policy Programme 1998 - 2004
- 2003 Evaluation report in Swedish Government Official Reports Series (SOU).
- 2004 **No** government bill on Energy RD&D! Reduced budget!!
FOKUS I: Priority setting
- 2005 FOKUS II: Goals, indicators etc
- 2006 Government Bill on Energy RD&D (prop. 2005/06:127)
- 2007 Start of first four year period 2007 - 2010
- 2009 FOKUS III: Further work om priority setting, goals, ojectives, vision, etc. Consultant engaged for evaluation
- 2010 Government Report to Parliament on Energy RD&D
- 2011 2nd four year period 2011 – 2014





1994: The Energy Commission

A Parliamentary Commission appointed 1994 to evaluate on-going energy policy programmes and to propose plan and timetable for the realignment of the energy system.

The Report of the Energy Commission 1995

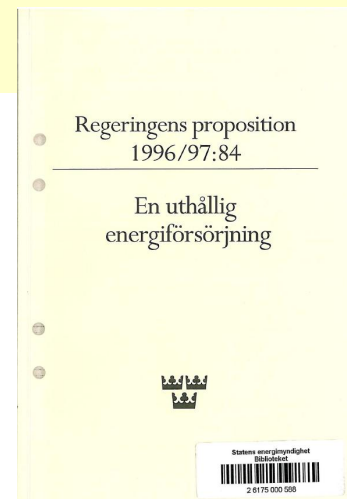
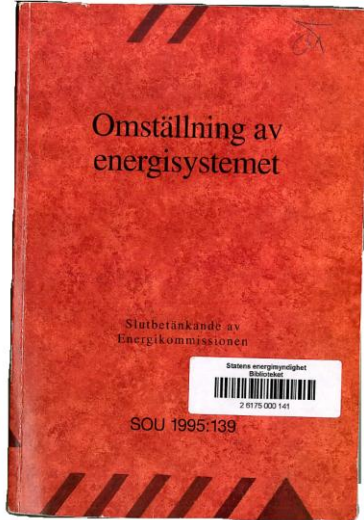
”A determined effort on RD&D is the basis of the long-term strategy for a sustainable energy system”

Substantial budget increase; about 50 %

Effort on saving electricity and new, renewable electricity production to enable decommissioning of nuclear power.

The Swedish Energy Agency created

Government Bill 1996/97:84 A Sustainable Energy Supply



Regeringens proposition
1996/97:84

En uthållig
energiförsörjning



Goals of the 1998 – 2004 Long Term Programme

Building scientific and technical knowledge and competence

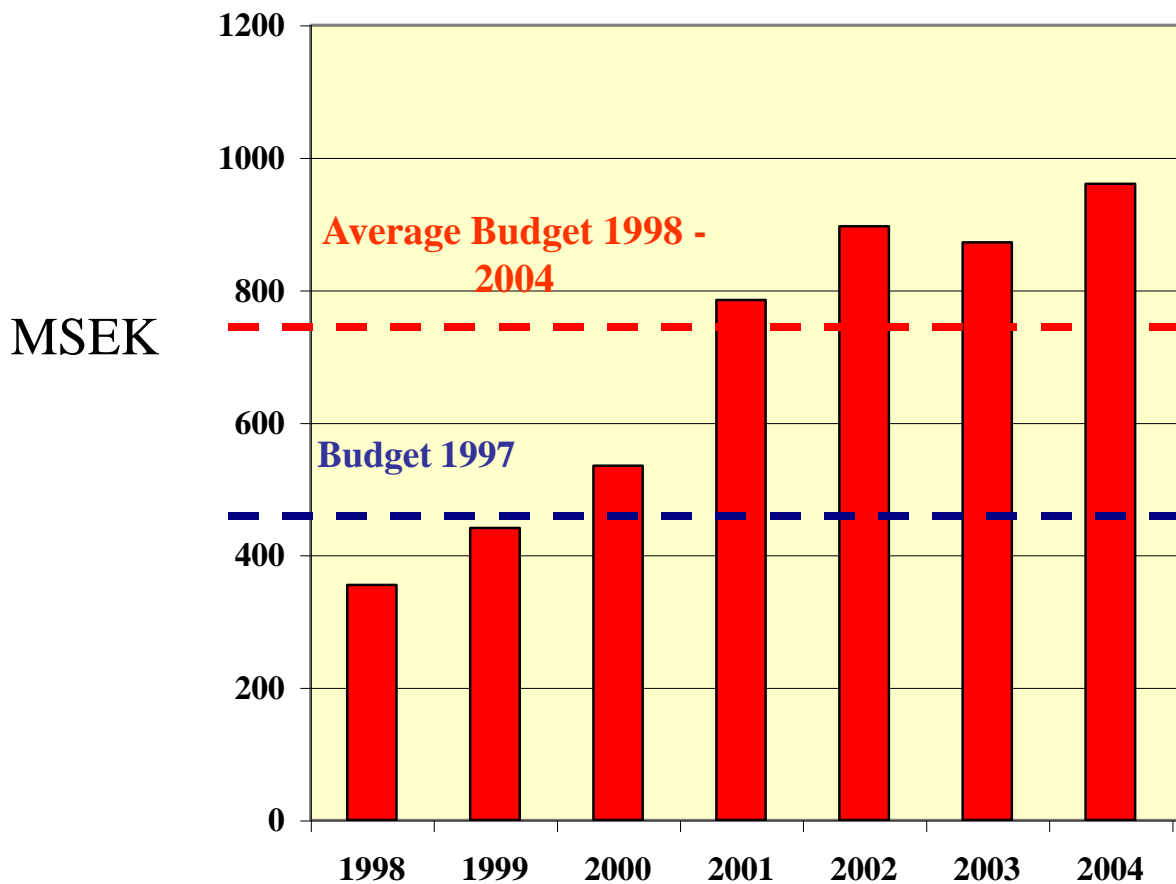
Contribute to stable conditions for competitive business sector

Contribute to the development of new energy technology

Introduce new renewable energy technology on the market, ...

... Thereby forcefully increase the heat and electricity generation from renewable sources

Spending and budgets 1998 - 2004





2002: The Commission on Energy Research, Development and Demonstration (the ERDD Commission)

Appointed 2002 to evaluate the long-term energy programme of 1998 – 2004 and to give recommendations on further ERDD measures

Commission led by Peter Nygårds, aided by secretariat and a reference group

A number of consultants' studies ordered, among them
Technopolis Ltd: *Evaluation of the Swedish Long Range Energy Research Programme 1998–2004*

2003: Commission report

- The orientation of ERDD appears, broadly speaking, reasonable. Nonetheless, there are problems in the form, for example, of fragmentation and insufficient focus on commercialisation.
- The quality and relevance of ERDD appear, overall, to be reasonable. However, there is some doubt regarding relevance, especially concerning the capacity of ERDD to result in commercialisation.
- The organisation of ERDD shows no fundamental defects, although the Commission considers that there should be greater organisational concentration of R&D resources in order to establish critical masses to a larger extent in the R&D sectors that are relevant.
- The impact of the programme would, in the Commission's estimation, be greater if a single arena for administration of state ERDD measures were created. Simultaneously, regarding the administration of the programme, it should be pointed out that much of the work carried out by the four public agencies responsible appears to be going well.
- The objectives that are primarily relevant to an assessment of the results of the programme may be said to have been largely fulfilled. However, they are worded imprecisely and hard to follow up.

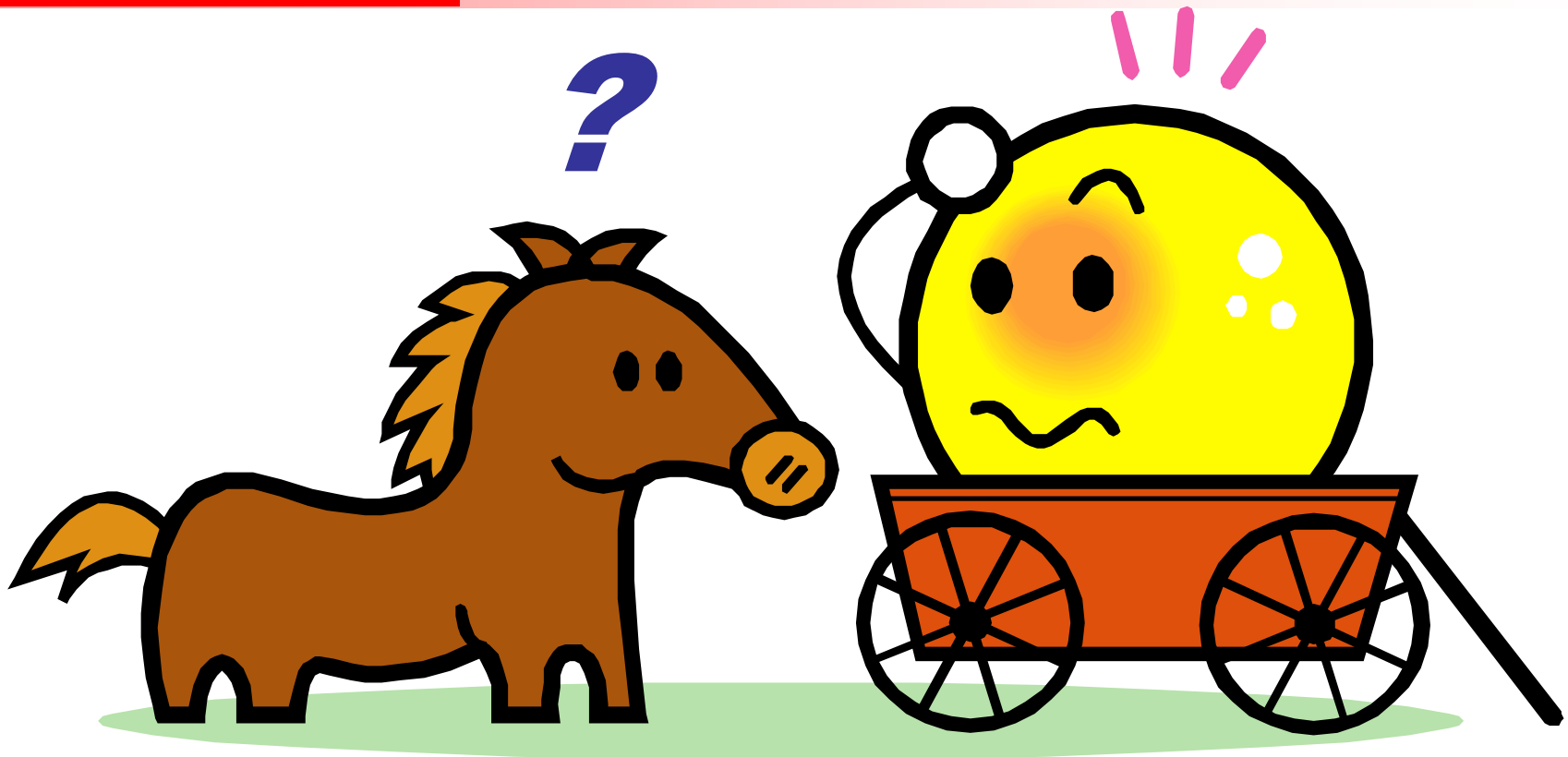


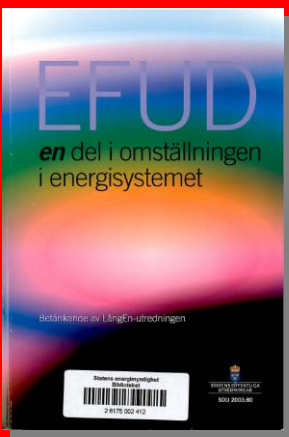
2003: Commission Report

On the programme of 1998:

”However, in the ERDD Commission’s opinion, there is abundant evidence that excessive faith was placed, in the energy policy resolution, on the capacity of ERDD to bring about the restructuring of the energy system. Both R&D and energy-system restructuring take time. Expectations of what can be accomplished through ERDD initiatives must therefore be reasonable.”*

Research Push or Demand Pull?





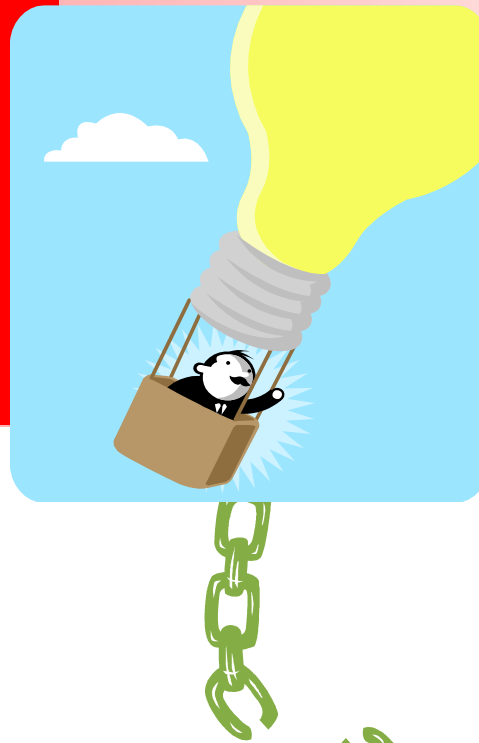
Objectives and priorities

Objectives are too generally worded in an imprecise manner ('contribute to' etc) and difficult to follow up. The Government should take the initiative in creating better scope for following up and evaluating the results from ERDD measures.

There is a lack of connection between the overall energy policy goals/programme goals on the one hand, and the activities in the different ERDD programmes and projects

A more explicit strategy to translate the overall goals into priorities for the ERDD programmes and projects is needed

Energy Policy Goals



**Programme
and project
goals**



**Follow-up?
Evaluation?**





2004: Government Bill on Energy Research, Development and Demonstration



Preparatory work by Swedish Energy Agency:

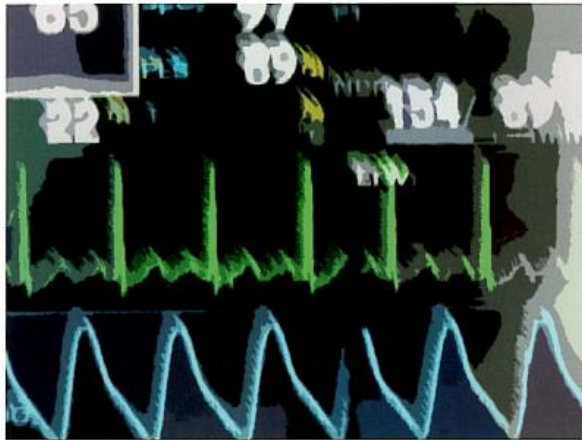
FOKUS I: Priority and Focus of the ERDD efforts

FOKUS II: Criteria for priorities, objectives, and indicators for follow up of ERDD efforts.

2006: Government Bill on ERDD

Regeringens proposition
2005/06:127

Forskning och ny teknik
för framtidens energisystem



Statens energimyndighet
Biblioteket



2 6175 004 816



ERDD Commission Report

FOKUS I

FOKUS II

Gvmt. Bill 05/06:127

Research and New Technology for the Energy System of the Future

Proposition 2005/06:127



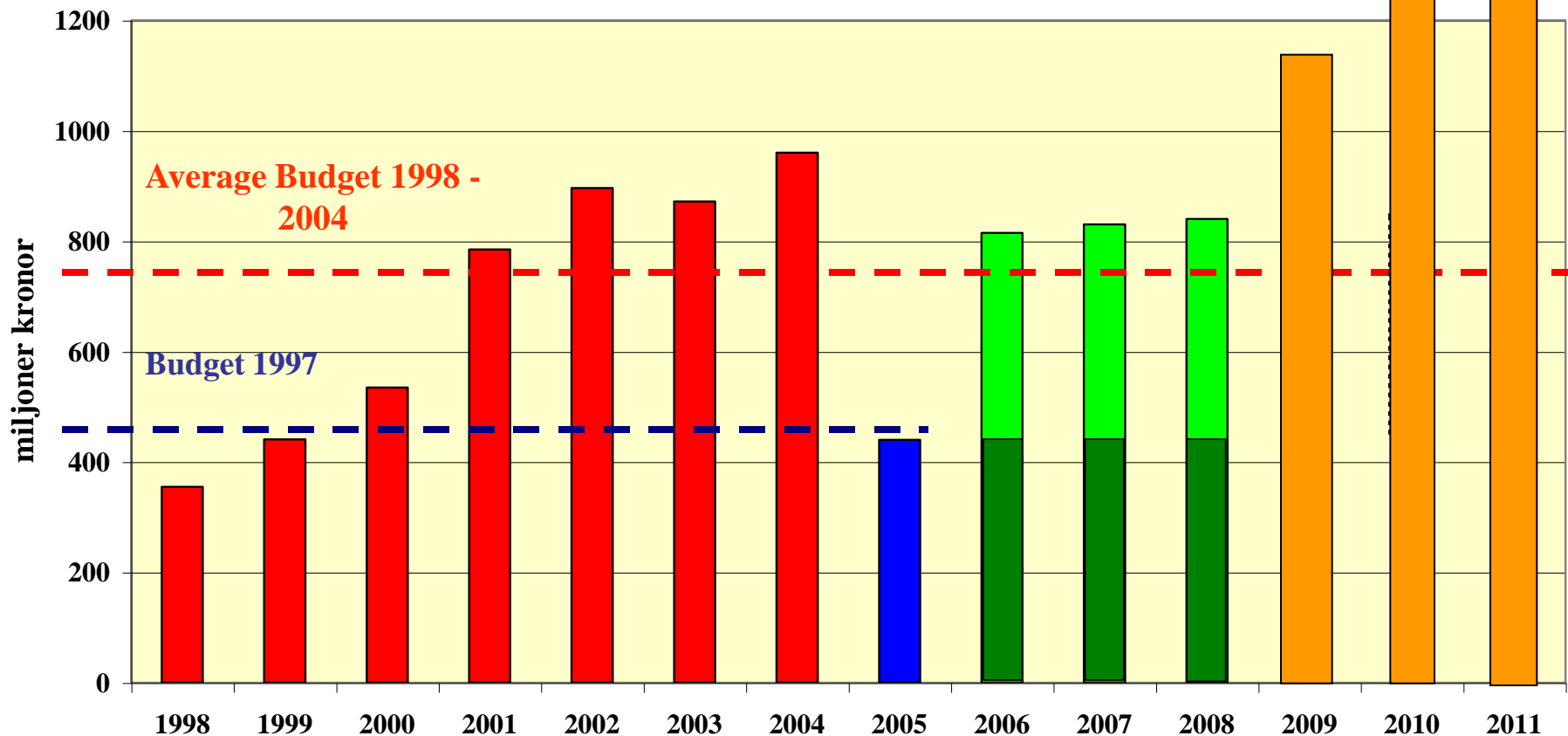
FAKTABLAD

Miljö- och samhällsbyggnads-
departementet

mars 2006

- Stable, long-term budget
- Focus and concentration
- Commercialisation
- Clear overall goal in combination with visions and operative goals.
- Six thematic areas
- Consolidation of responsibility for the ERDD programme at the Swedish Energy Agency

Spending and budgets 1998 -





Energy RD&D: Overall objectives

Parliamentary decision

- ➔ to build up the scientific and technical knowledge and expertise within universities, colleges, other higher education institutions, government agencies and in the business sector necessary to enable a transition to a long-term sustainable energy system in Sweden through application of new technology and new services, and
- ➔ to develop technology and services that, through the Swedish business sector, can be commercialised and thereby contribute to the transition and development of the energy system in Sweden and in other markets.



Six thematic areas of energy RD&D

- | | |
|-------------------------------------|--|
| 1. The Building as ... | Renewable Heating, etc |
| 2. The Transport Sector | Biofuels, EHV's |
| 3. Fuel-Based Energy Systems | Biomass Production, Forestry, Agriculture |
| 4. Energy-Intensive Industry | Biocombines, RES in Industry Processes |
| 5. Power Systems | Wind, Solar, Hydro, Wave, etc |
| 6. Energy Systems Studies | RES in the Energy System |

Development Platforms



Advisory expert groups for strategic planning and prioritization

One "platform" for each Thematic Area, matched by agency group of experts and desk officers for each area

A dozen or so experts from stakeholders: industry, society, etc:

- Good overall perspective
- Entrepreneurial competence
- Knowledge of the energy innovation system
- Knowledge of the market
- Extensive personal network
- High level position
- Good knowledge of subject area



Goal Structure

VISION

**Mid-term
objectives**

ERDD Goal

From gvmt bill: Clear and measurable goals are to ensure that the ERDD resources are used in the best possible way.

The overall ERDD goal should therefore be translated into visions, mid-term objectives and ERDD Goals.



Time horizons

ERDD Goals - Programme Period 2011-2014

(To be evaluated 2015)

Mid-term objectives

- for 2010

VISION - for 2050

Examples



Visions, transport: The human health effects of the Transport System has been dramatically reduced

Swedish production technology for CO₂ effective transport fuels are commercial

Mid-term objectives, Industry 2020: Industrial waste heat over 55 oC is fully utilised in the south of Sweden and distributed by district heating

Sulphate pulp mills have reduced the use of fossil energy to 10 litre oil per tonne of pulp

ERDD Goals, Power 2014: research teams of top world class within one or more of the prioritized areas in power RDD

Swedish research in leading roles in a number of EU research initiatives

Overall Perspective



Electricity certificates

Innovation & commercialisation

Wind Programme

Consumer advice

TestLab

ERDD

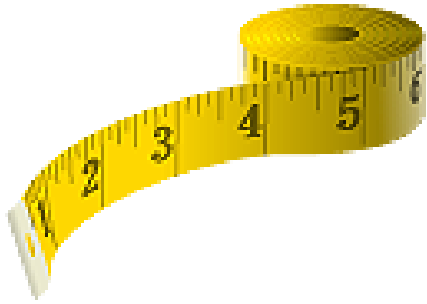
Programmes for Energy Efficiency

International Collaborations

Analysis Department

Investment support
Sidan 24

Measures and Indicators to ensure proper follow-up and monitoring (examples)



Specific indicators for monitoring of the mid-term goals of the FOKUS Strategic Plans (Effektmålen); etc etc

Indicators for knowledge and competence building: PhD and licentiat degrees p.a. (number), Number of Senior researchers in field (number), Peer reviewed publications (number), Use of results from a specific project/programme in public enquiries, new laws and regulations, environmental permit processes, political decisions, new policies and measures etc. (yes/no), Participation in international network/collaboration etc (yes/no), Results used in education (yes/no); etc etc

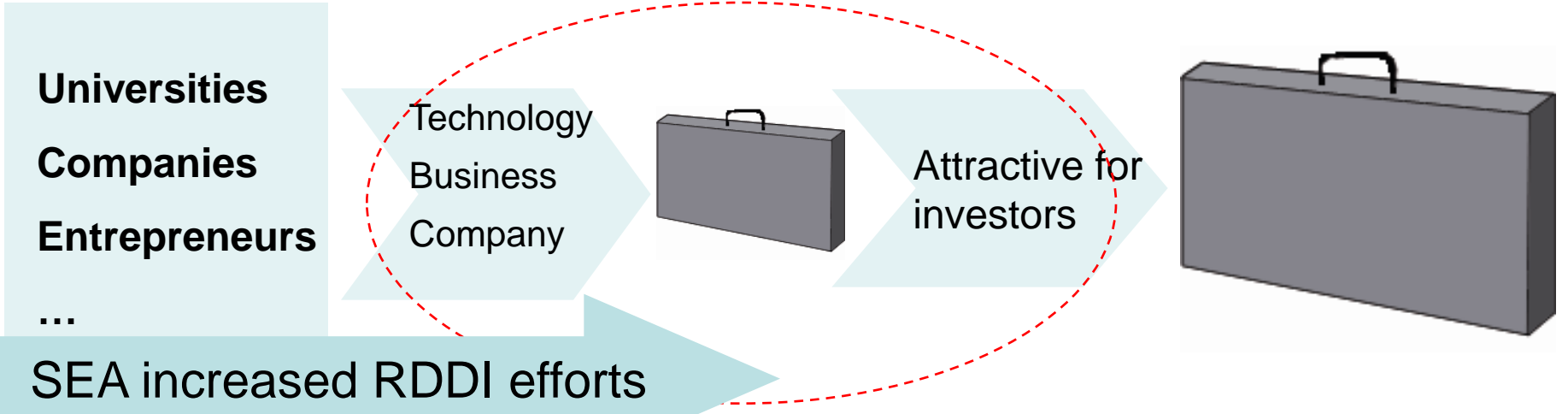
Indicators for monitoring of commercialisation, etc: Patents, licenses, etc (number), Venture capital invested (Million SEK), New companies or employment created (numbers), New/better products/services are introduced to the market, nationally or internationally (yes/no), Activity contributes to regional development (yes/no); etc etc



New Business Development Unit at Swedish Energy Agency



Critical sector



Traditional Funder

Business Dev. & New Ventures

Early Venture Cap

Traditional VC





Project Portfolio – around 40 companies



SootTECH



KEEK Biobränsle



Cellkraft 



Control Drive Europa AB

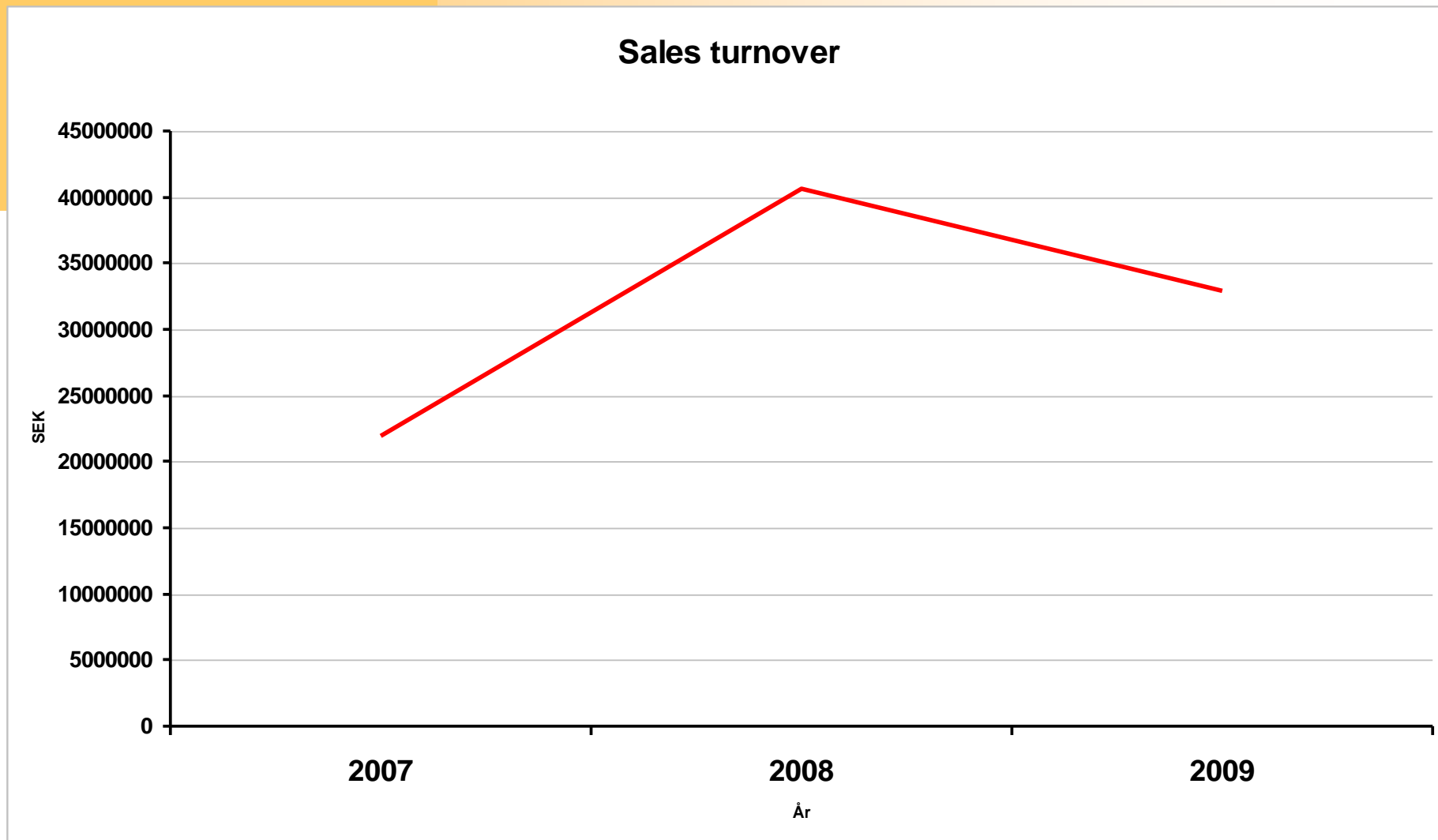
TRANSiC



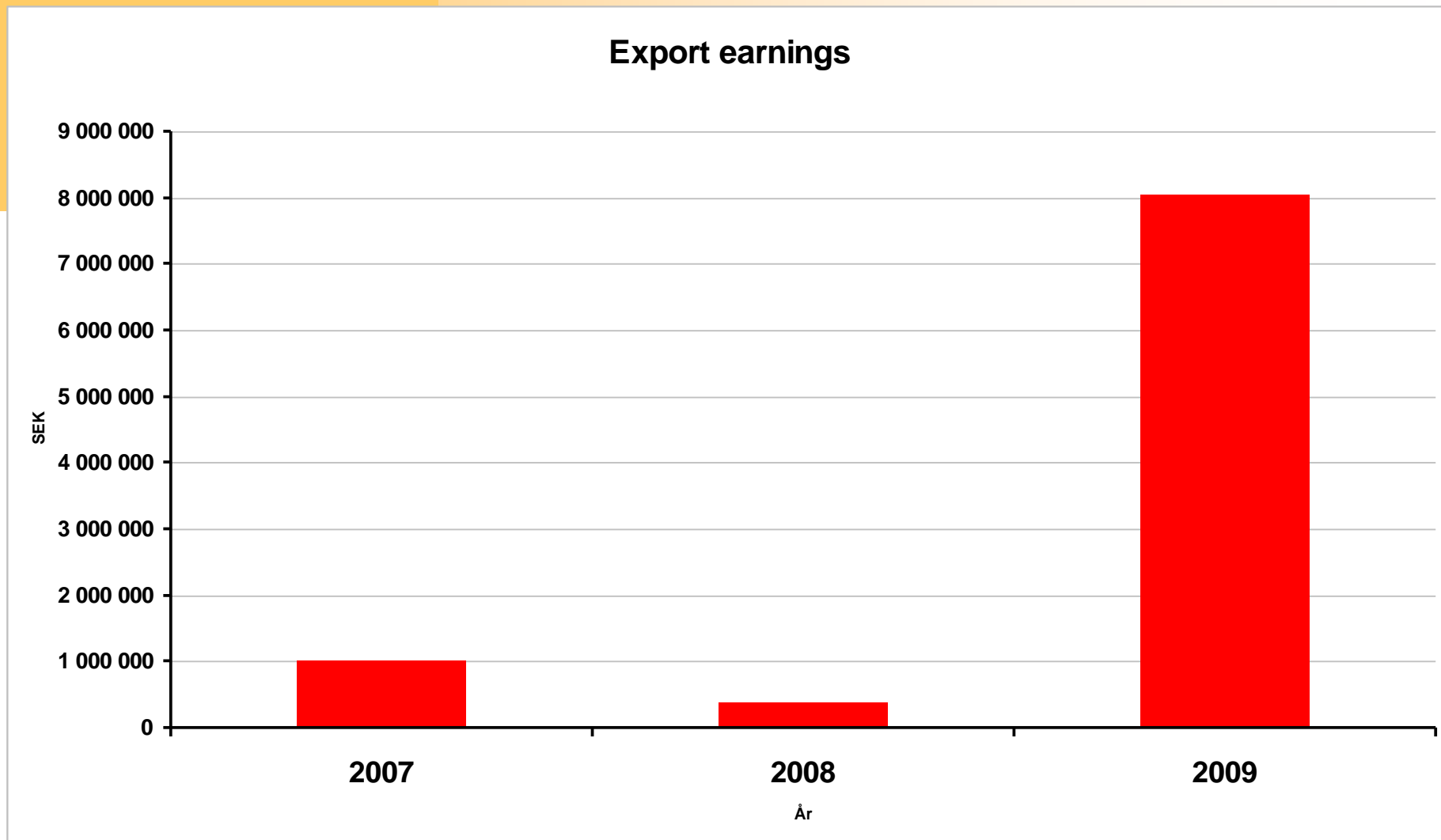
ETC
Battery and FuelCells Sweden AB



Statistics - Portfolio Companies

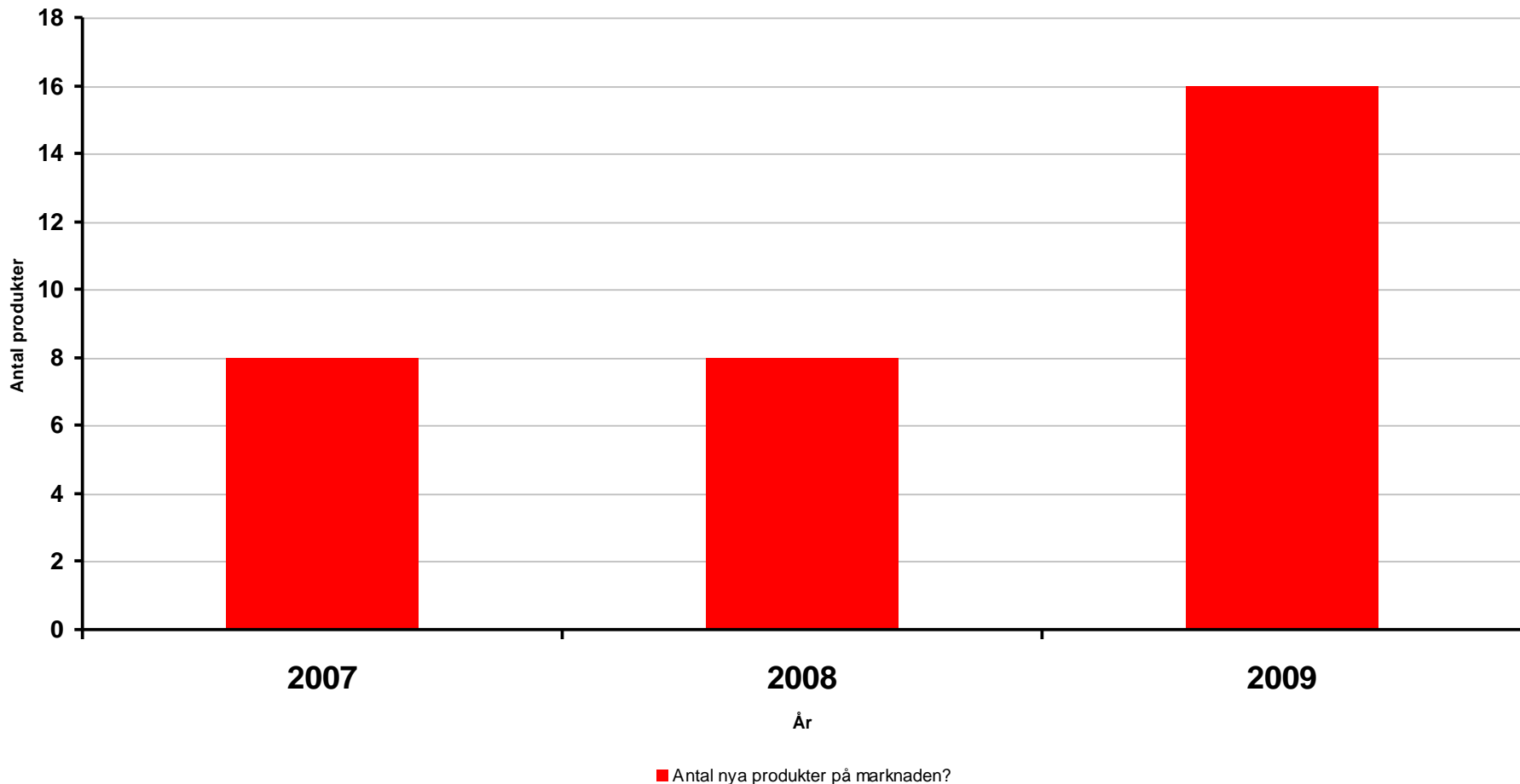


Statistics - Portfolio Companies



Statistics - Portfolio Companies

Number of New Products on Market



FOKUS, Evaluation, Gvmt Report, ...

FOKUS III

Energimyndighetens strategi för forskning, utvärdering, demonstration, innovation och kommersialisering för perioden 2011-2014

ER 2009:32

Avsedd för
Näringsdepartementet

Dokumenttyp
Rapport

Datum
2010-02-08

Ert Dnr
N2009/7332/E

INSATSERNA FÖR FORSKNING OCH INNOVATION INOM ENERGIOMRÅDET



RAMBOLL

Regeringens skrivelse
2009/10:168



Skr.
2009/10:168

Utvärdering av insatserna för forskning och innovation inom energiområdet

Regeringen överlämnar denna skrivelse till riksdagen.

Stockholm den 18 mars 2010

Fredrik Reinfeldt

Åsa Torstensson
(Näringsdepartementet)

Skrivelsens huvudsakliga innehåll

I denna skrivelse redogör regeringen på en övergripande nivå för hur de av Statens energimyndighet (Energimyndigheten) administrerade statligt finansierade insatserna för forskning och innovation inom energiområdet har bedrivits sedan 2007. Syftet är att svara på frågan om huruvida denna verksamhet motsvarar intentionerna i propositionen *Forskning och ny teknik för framtidens energisystem* (prop. 2005/06:127).

Det är regeringens bedömning att Energimyndighetens verksamhet inom forskning och innovation inom energiområdet motsvarar intentionerna. Energimyndigheten arbetar med tydliga och uppföljningsbara mål för verksamheten och till stor del har den önskvärda ökade fokuseringen av insatserna uppnåtts. Myndigheten samverkar med andra aktörer, såväl nationella som internationella, på ett ändamålsenligt sätt.

Verksamheten kan konstateras bidra till målen om omställning av energisystemet, ökad kunskap och kompetens samt kommersialisering och övrigt nyttiggörande av resultaten. På grund av energiforskningens långsiktiga natur och interaktionen med andra styrmedel är det svårt att kvantifiera verksamhetens bidrag till energiomställningen. Det är dock regeringens bedömning att uthålliga satsningar, i alla faser från forskning till marknadsintroduktion, på bl.a. effektiv energianvändning, ny energiteknik, nya material och förändrade beteenden är nödvändiga för att målen för energiomställning ska uppnås. Utveckling av ny hållbar energiteknik kan därtill bli avgörande för att lösa globala energi- och miljöproblem. Energimyndigheten har en nyckelroll för att öka Sveriges bidrag i detta arbete och samtidigt skapa möjligheter för svensk teknikexport.

Regeringen bedömer att mål och inriktning för de statligt finansierade insatserna för forskning och innovation inom energiområdet bör ligga fast.



Gvmt Assessment

The Programme is running according to intentions; but

- More commercialisation and useable results!
- Continue to ensure quality
- More competence on IPR needed
- Quicker decisions on rejection
- Too many goals? Too much consensus? More "daring"?
- Put ERDD in the bigger context
- Closer collaboration with other government agencies

Thank you for your attention!

SENIOR MANAGEMENT

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