



INTERNATIONAL ENERGY AGENCY

In support of the G8 Plan of Action

# DEPLOYING RENEWABLES

Principles for  
Effective Policies




# INTRODUCTION

Recent IEA and other scenarios have demonstrated that a large basket of sustainable energy technologies will be needed to address the challenges of moving towards clean, reliable, secure and competitive energy supply. Renewable energy technologies can play an important role in achieving this goal. Many countries have made progress in promoting renewables in their energy mix, but obstacles remain and greater efforts are needed. The publication *Deploying Renewables: Principles for Effective Policies* provides an assessment of the effectiveness and efficiency of renewable member countries and Brazil, South Africa (BRICS). In 2005, these 35 countries accounted for 80% of total electricity generation, 77% heating/cooling (excluding and 99% of renewable energy policies in OECD Russia, India, China and 2005, these 35 countries global commercial renewable of commercial renewable the use of traditional biomass) transport fuel consumption.



In 2005, renewables (including hydropower) contributed 18% of global electricity generation, less than 3% of global heat consumption (excluding the use of traditional biomass<sup>1</sup>) and 1% of global transport fuel consumption. By 2030, renewables are projected to contribute 29% to power generation and 7% of transport fuels according to the IEA *World Energy Outlook (WEO) Alternative Policy Scenario 2007* – in which policies currently under consideration are implemented. By 2050, the contribution of renewables could rise even further to almost 50% of electricity if the ambitious goal of a 50% global reduction in 2005 CO<sub>2</sub> emissions over that time horizon is met, represented by the BLUE scenarios in the IEA *Energy Technology Perspectives (ETP) 2008*. While attainable, this objective will require strong political and financial commitment as well as immediate action by all governments.

1. The use of traditional biomass is around 40 EJ or 9-10% of world primary energy supply.



Some renewable energy technologies (RETs) are close to becoming commercial and should be the first to be deployed on a massive scale. Other RETs, which have a large potential, are less mature and require long-term visions. It is only through a combined effort in research, development and demonstration (RD&D) and technology learning resulting from marketplace deployment that their costs will be reduced. *ETP 2008* emphasises that a combination of both more and less mature RETs must play a major role in achieving deep CO<sub>2</sub> emission cuts in a competitive fashion. This finding highlights the urgency with which a framework of consistent, effective and long-term policies need to be implemented if a wide range of RETs is to be encouraged to move towards full market integration.

*Deploying Renewables: Principles for Effective Policies* comprehensively examines data and information relating to renewable energy markets and policies over the period 2000-2005. The study discusses wind, biomass, biogas, geothermal, solar PV, and hydro power in the electricity sector; biomass heat, geothermal and solar thermal in the heating sector; and ethanol and biodiesel in the transport sector.



# KEY

Only a limited set of countries have implemented effective support policies for renewables which led to an acceleration in renewables diffusion in recent years. There is a large potential for improvement of policy design in most countries and there is considerable realisable potential across all RETs in all the OECD member countries and BRICS reviewed. The analysis suggests that if effective policies were adopted in many more countries, this potential could be exploited more rapidly and to a much larger extent.

Non-economic barriers can significantly hamper the effectiveness of policies and drive up costs, irrespective of the type of incentive scheme. It is therefore necessary to move past discussions over which specific incentive scheme functions best and instead assess the entire policy framework into which the incentive scheme is inserted. Overall, the effectiveness and efficiency of renewable energy policies are determined by the adherence to key policy design principles outlined below, as well as the consistency of measures.

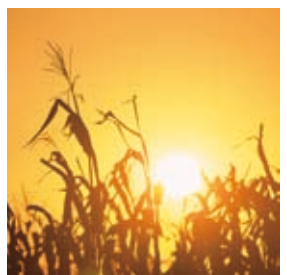
# MESSAGES

## Renewable policy design should reflect five fundamental principles

- 1 ▲ the removal of non-economic barriers, such as administrative hurdles, obstacles to grid access, poor electricity market design, lack of information and training, and the tackling of social acceptance issues - with a view to overcome them - in order to improve market and policy functioning;
- 2 ▲ the need for a predictable and transparent support framework to attract investments;
- 3 ▲ the introduction of transitional incentives, decreasing over time, to foster and monitor technological innovation and move technologies quickly towards market competitiveness;
- 4 ▲ the development and implementation of appropriate incentives guaranteeing a specific level of support to different technologies based on their degree of technology maturity, in order to exploit the significant potential of the large basket of renewable energy technologies over time; and
- 5 ▲ the due consideration of the impact of large-scale penetration of renewable energy technologies on the overall energy system, especially in liberalised energy markets, with regard to overall cost efficiency and system reliability.

Analysis suggests that policy frameworks which combine different technology-specific support schemes as a function of RET maturity would be best suited to successfully implement the key policy design principles and foster the transition of RETs towards mass market integration.

National circumstances (RET potential, existing policy framework, existence of non-economic barriers, degree of market liberalisation and energy system infrastructure) will influence the actual optimal mix of incentive schemes and choosing when to complement R&D support with deployment support will be critical to the overall success of support policies.

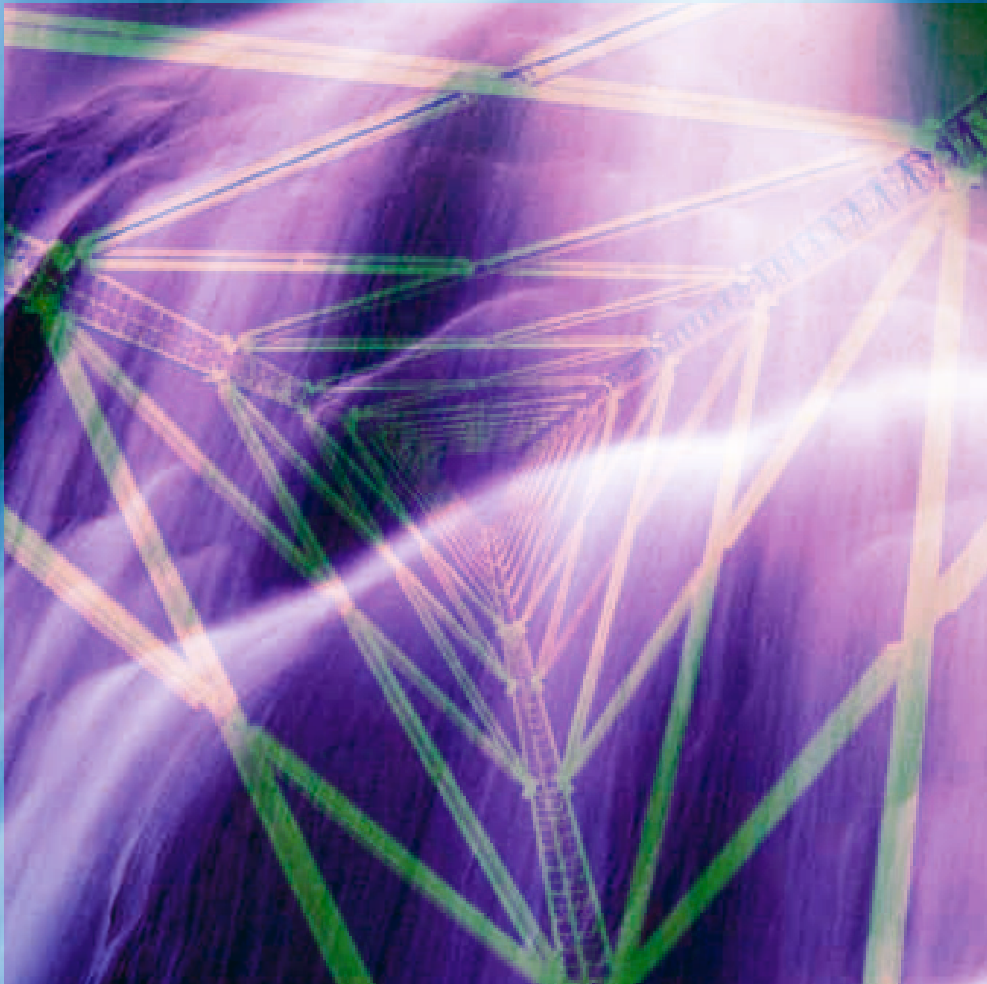
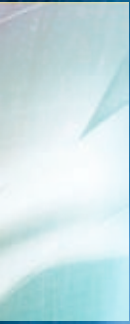


# RECOMMENDATIONS

## **All governments are encouraged to note the following recommendations relating to policies supporting RET deployment**

- Realise the urgency to implement effective support mechanisms in order to exploit the major potential of renewable energy technologies to improve energy security and tackle climate change;
- Remove and overcome non-economic barriers as a first priority to improve policy and market functioning;
- Recognise the substantial potential for improvement of policy effectiveness and efficiency in most countries and learn from good practice;
- Focus on coherent and rigorous implementation of the five fundamental policy design principles, with the aim of maximising long-term cost efficiency while having regard to national circumstances;
- Create a level playing field by pricing greenhouse gas emissions and other externalities appropriately in the market; and
- Move towards a combination framework of support schemes as a function of technology maturity level in order to foster smooth transition of renewable energy technologies towards mass market integration, progressively employing market forces.





# DEPLOYING RENEWABLES

## Principles for Effective Policies

Renewable energy can play a fundamental role in tackling climate change, environmental degradation and energy security. As these challenges have become ever more pressing, governments and markets are seeking innovative solutions. Yet, what are the key factors that will determine the success of renewable energy policies? How can current policies be improved to encourage greater deployment of renewables? What impact can more effective policies have on renewables' share in the future global energy mix and how soon?

*Deploying Renewables: Principles for Effective Policies* addresses these questions. Responding to the Gleneagles G8 call for a clean and secure energy future, it highlights key policy tools to fast-track renewables into the mainstream. This analysis illustrates good practices by applying the combined metrics of effectiveness and efficiency to renewable energy policies in the electricity, heating and transport sectors. It highlights significant barriers to accelerating renewables penetration, and shows that the great potential of renewables can be exploited much more rapidly and to a much larger extent if good practices are adopted.

Carefully designed policy frameworks, customised to support technologies at differing stages of maturity, will deliver a strong portfolio of renewable energy technologies. *Deploying Renewables: Principles for Effective Policies* provides recommendations on key principles for policy design as a template for decision makers.

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