



MINISTRY OF
RURAL
DEVELOPMENT

NATIONAL
ENVIRONMENTAL
TECHNOLOGY INNOVATION
STRATEGY
2011–2020

National Environmental Technology Innovation Strategy



Budapest
2012

Publisher: Ministry of Rural Development, Budapest, Hungary
Responsible publisher: Dr. Sándor Fazekas minister
Responsible editors: Dr. Zoltán Illés state minister, Enikő Csoma head of department
Contributors: Beatrix Kiss, Teodóra Fáta Kristóf, Zoltán Palotai, Katalin Papp, Dr. Elemér Szabó

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Published: 500 copies

Printing preparation: Katalin Dancs
Printing: Pharma Press

Contact: kornyezettechnologia.kormany.hu

FOREWORD

The undergoing economic crisis has put the spotlight on the crucial need for innovation aiming at decoupling economic development from environmental pressure. Eco-innovation plays a central role in building green economy and in developing resource efficient, environmentally friendly technologies.

The National Environmental Technology Innovation Strategy (NETIS) explores the fundamental linkages between innovation and green economy for the period of 2011–2020. Furthermore, NETIS aims at providing a framework for the implementation of EU 2020 Strategy at national level. According to NETIS, environmental technologies are not just individual technologies, but also total systems that include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures.

By adopting NETIS, the Hungarian Government has expressed its determination for mainstreaming the concept of green economy. Eco-innovation can offer new, green solutions for the whole economy therefore investments in the eco-innovation mean investing to the future.

Dr. Sándor Fazekas
Minister



Dr. Zoltán Illés
State Minister



1. INTRODUCTION

Over the recent years, the world has witnessed the emergence of multiple global crises related to food, fuel, freshwater and finance. Instability in energy and commodities markets, global food shortages and water scarcity have, most recently, been overshadowed by a financial and economic crisis whose recessionary impacts are still being felt in most parts of the world.

While it is clear that governments and the international community face multiple and serious challenges, the situation also presents real opportunities to make profound changes to the economy. A shift towards a green and low carbon economy can deliver multiple benefits for each country.

Innovation has an important role in generating employment, enhancing productivity growth through knowledge creation and diffusion in the post-crisis context therefore the Hungarian Government has decided to give an effective and fast response for the challenges ahead and created the *National Environmental Technology Innovation Strategy* (Government Decision No. 1307/2011. (IX. 6.)). The Strategy (NETIS) explores the crucial linkages between innovation and green growth. It reviews the current position of environmental industry and policy practices to foster eco-innovation, and explores concepts and measures. More importantly, it examines the policy interventions that will be needed to steer innovation towards sustainable development and encourage industry to take up sustainable practices.

2. SCOPE OF THE STRATEGY

NETIS is determined to provide a crucial framework for ensuring the implementation of EU 2020 Strategy, with special regard to the "Innovation Union" flagship initiative.

The undergoing economic crisis has put the spotlight on the crucial need for innovation aiming at decoupling economic development from environmental pressure (intensive, unsustainable resource use, unavoidable environmental pollution). The fact that Hungary is a country which strongly relies on energy and material imports, urges

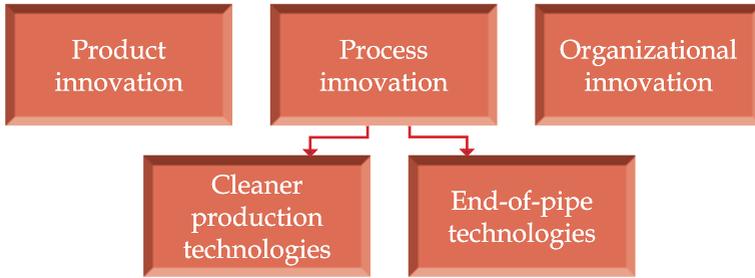
further measures aimed at higher resource efficiency. With the adoption of NETIS the Hungarian Government expresses its determination for mainstreaming the concept of green economy that requires environmental technology innovation.

The connection between NETIS and different sectorial innovation strategies



3. STATEMENT OF NEEDS

According to NETIS, environmental technologies are not just individual technologies, but total systems that include know-how, procedures, goods and services, and equipment as well as organizational and managerial procedures. Environmentally sound technologies protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their waste and products, and handle residual waste in a more acceptable manner than the technologies for which they were substitutes. As shown in the figure below, there is a wide scope for innovation and intervention in this field.



The Strategy deals with specific issues such as:

- product technologies: e.g. that generate low or no waste and promote the prevention of pollution
- process technologies: cleaner production technologies, end of the pipe technologies
- know-how, procedures, goods and services, equipment, organisational and managerial procedures

4. INDICATORS

Innovation is a key driver of productivity, increased energy, carbon, water and material efficiency, the improved performance of goods and services, and the creation of new markets and jobs. Innovation relates to both technological and non-technological innovation, which covers integrated environmental strategies, responsible management practice and new business models (such as eco-efficiency).

In connection, as a response and a tool reaching the EU 2020 Strategy targets the National Environmental Technology Innovation Strategy sets clear measures and indicators (see below) for raising employment decreasing environmental pressure and, in general, fosters the social and economic cohesion in Hungary. Various current EU policies has been taken into consideration during the elaboration of the Strategy, such as ETAP, IPP, Innovation union flagship initiative, Resource-efficient Europe flagship initiative and Ecodesign directive. Strategy fits in the current green industry and green economy mainstream. The Strategy is connected to the EU thematic Strategy on the Sustainable Use of Natural Resources, which provides a broad strategy to reduce the negative environmental impacts of using natural resources.

Indicator	Unit
Material intensity and productivity	DMI/GDP, DMC/GDP, DMI/cap, DMC/cap
Energy intensity, energy productivity	toe/GDP, toe/cap
Ecological footprint	ha/cap
Water intensity	m ³ /GDP, litre/cap/day
Import dependency from fossil energy carriers and raw materials	%
Use and exploitability of renewable energy sources (wind, water, biomass, solar, geothermal energy)	share of renewable energy sources in total energy supply and electricity generation: %
Transport modality and efficiency, logistic solutions	water, railway, road pipeline transport: tkm/GDP, toe/tkm
Pollutant emissions concerning full production process	GHGs, heavy metals, toxic substances, VOCs: t
Additional pollutant release and use of packaging materials in trade sector	GHGs, VOCs: t
Generation, recycling and treatment of waste	t/GDP, t/cap, %
Generation, discharge and treatment of waste water	m ³ , %
Public and private expenditures for environment related R+D+I	million HUF, GERD %
Change of consumption patterns	trade of appliances with low energy consumption (million HUF), selective waste collection, t/cap, %
Employment in environmental industry, research and services	%, cap
Environment-related registered patents and trademarks, remediation	pieces, m ²
Export income from environmental industry trading	million HUF

5. VISION AND OBJECTIVES OF THE STRATEGY

An effective policy mix in the Strategy draws on a wide set of policy instruments and it is tailored to circumstances. Identifying effective policy mixes is important from the point of view of economic efficiency, environmental integrity and policy coherence. An effective policy mix typically involves two or less instruments that address the same environmental externality.

- The Strategy highlights the importance of stimulating green/sustainable public procurement, especially concerning eco-innovation, eco-design for sustainable goods and services, energy-efficiency/resource efficiency, non-hazardous technology and products. Governments, as with consumers, have a strong impact on the market for sustainable goods and services.
- Instruments that lead to sustainable behavioural change across firms, households or individuals include regulations, policies to support green technologies and innovation, and voluntary approaches, including corporate social responsibility activities.

Vision and Objectives	Policy tools - measures
<ul style="list-style-type: none"> • Foster environmental industry, technology • Increase share of environmental related innovations, competitiveness • Paradigm shift: from end-of-pipe approach to prevention • Increase effectiveness • Decrease primary material use • Increase reuse/recycling, improve resource-efficient services 	<p>Greening governance – increase internal government cooperation including authorities and local governments</p> <p>Legal tools: Innovation friendly legal system (e.g. simplification of administrative procedures, pressure to comply with legal requirements, extension of producers’ liability)</p> <p>Economic Instruments:</p> <ul style="list-style-type: none"> • Greening tax system • Green public procurement • Supporting environmentally friendly subsidies (removing environmental harmful ones) <p>Social tools: raising awareness, improving green education, management and consultancy</p>

- Both predictable and challenging regulations support the development of new environmentally friendly technologies and their successful introduction on the market. The potential for green growth will be improved if regulation is designed to be effective and to minimise (administrative) costs to businesses as well. Environmental standards and other environmental regulation are important driving factors for eco-innovation and for achieving environmental goals. This includes voluntary standards, ratings, labelling and certification.
- As a consequence of the shift towards a sustainable economy, investing in green/sustainable production will become more attractive and new business and employment opportunities will develop. It is important to facilitate these solutions, for example by adapting the education system.
- For a successful transition towards a green economy, support is needed from citizens and companies. The Strategy stresses the importance of increased cooperation between the public sector and industry, non-governmental social partners and consumer organisations, and of stimulating private-sector investments to enhance commercialisation of R&D results and innovations, as well as to substantially increase R&D investments in low carbon and other clean technologies.

Environmental technology tools of interventions

- Technological innovations in pollution prevention
- Environment-based innovation of products / eco-friendly product design
- Environmental innovation in services/greener services
- Technological innovation in pollution management
- Impact assessment of environmental technology
- Incorporation of environmental technologies in education, social awareness-raising programs
- Field specific innovations (e.g. separately collected waste processing, development of water saving agricultural technologies and sewage treatment procedures, innovation of low-waste technologies)

Horizontal type technological innovations



Targets:

- Sustainable resource management
- Improvement of resources efficiency
- Application/use of key technologies to decrease the environmental burden of relevant sectors

Development areas:

Resource efficiency increasing technological innovations, such as:

- Application of nanotechnology in the field of energy, environment and production technology,
- Application of biotechnology in the field of agricultural, food production -, chemical-, energy sectors and in the field of environmental remediation
- Use of photonics in renewable energy production technologies
- Development of advanced materials
- Bio-based products

Air



Targets:

- Improvement of air quality of settlements decreasing the transport-originated air pollution, specially the emission of PM
- Decreasing the air pollution coming from households

Development areas:

- Development of public transport vehicle fleets
- Improvement of traffic control and settlement development aiming at reducing transportation needs
- Upgrading heating and energy efficiency in households

Waste



Targets:

- Recycling of paper-, plastic-, glass-waste, recycling of demolition waste
- Decreasing the organic content of the municipal waste before disposal
- Reducing the waste production
- Less hazardous waste
- Selective collection of municipal waste

Development areas:

- Low-waste technologies
- Separately collected waste processing, (particularly iron, steel, paper, glass, plastic)
- Production of secondary raw materials from waste (e.g. construction and demolition, rubber, textiles)

Water



Targets:

- Decreasing the specific water use in industry and agriculture
- Waste water recycling as nutrient and energy source
- Ensuring high quality drinking water supply

Development areas:

- Water-efficient technologies
- Introduction and development of relevant key technologies
- Water-saving agricultural technologies
- For drinking water: iron and manganese removal technologies

Noise and vibration



Targets:

- Decreasing the noise pollution in settlements
- Vibration protection, with special attention to the transport

Development areas:

- Noise barriers
- Noise and vibration reducing traffic developments
- Sound insulation providing by building materials

Construction industry



Targets:

- Environmental friendly construction
- Sustainable resource management
- Energy efficient buildings

Development areas:

- Building materials from renewable sources
- Use of secondary raw materials
- Use of renewable energy sources
- Thermal insulation

Renewable energy



Target:

- Efficient use of different renewable energy resources

Development areas:

- Heat pump energy use
- Waste heat capturing, integrated (cascade), waste heat capturing
- Integrated (cascade), heat energy recovering systems
- Geothermal energy use
- Domestic use of solar energy in households
- Sustainable use of biomass, waste/by-products of food production
- Small wind turbines
- Developing options for energy storage
- Development of photovoltaic technologies, installations, equipments

Remediation



Targets:

- Remediation of polluted compartments (soil, water) and monitoring
- Giving priority to the „green“ remediation

Development areas:

- Bioremediation
- Innovative technologies
- In-situ processes

Agriculture and soil protection



Targets:

- Decreasing the environmental pressure originating from agriculture
- Soil protection
- Improving the efficiency of water use
- Decreasing the use of pesticides, (enhancing the sustainable pesticide use)
- Reducing the soil pollution
- Reducing the waste production

Development areas:

- Agricultural technologies, processes with lower environmental impacts
- Organic farming technologies
- Increasing efficiency of nutrients use,
- Irrigation and water recycling technologies
- Biological agents, integrated pest management techniques
- Agricultural waste energy recovery
- Use of geothermal energy in agriculture



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