INTOSAI
Working Group
on Environmental
Auditing

Auditing Sustainable Energy

Guidance for Supreme Audit Institutions

2010

This publication was prepared by the INTOSAI Working Group on Environmental Auditing (WGEA). The WGEA aims to encourage the use of audit mandates and audit methods in the field of environmental protection and sustainable development by Supreme Audit Institutions (SAIs). The WGEA has the mandate to

- help SAIs gain a better understanding of environmental auditing issues,
- facilitate exchange of information and experiences among SAIs, and
- publish guidelines and other informative materials.

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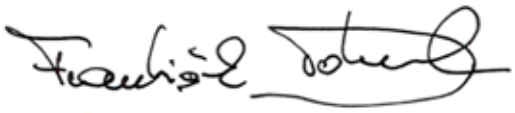
Readers are invited and encouraged to consult this paper as well as information on other WGEA products and services in the INTOSAI WGEA website http://www.environmental-auditing.org/

We wish our readers much success in applying this Guidance to their audits.

Mihkel Oviir
Auditor General of Estonia
Chair of INTOSAI WGEA



František Dohnal
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of the Czech Republic

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Acronyms and Abbreviations

CO_2	carbon dioxide
EC	European Commission
EIA	Environmental Impact Assessment
EP	European Parliament
EU	European Union
EUROSAI	European Organisation of Supreme Audit Institutions
GW	gigawatt
GWh	gigawatt hour
ICT	information and communication technology
IEA	International Energy Agency
INTOSAI	International Organisation of Supreme Audit Institutions
IPCC	Intergovernmental Panel on Climate Change
MW	megawatt
MWh	megawatt hour
NO_x	nitrogen oxides
OTEC	Ocean Thermal Energy Conversion technology
PPP	Public Private Partnership
R&D	research and development
RER	renewable energy resource
SAI	Supreme Audit Institution
SEA	Strategic Environmental Assessment
TJ	terajoule
TWh	terawatt hour
UN	United Nations
UNEP	United Nations Environment Programme
WGEA	Working Group on Environmental Auditing
WMO	World Meteorological Organization

Foreword

The issue of sustainable energy has not been audited extensively by the Supreme Audit Institutions yet. The Supreme Audit Office of the Czech Republic has some experience with audits in this area and so it accepted the role of the project leader for this Guidance document.

Preparation of such Guidance is in accord with Goal 1 of the INTOSAI Working Group on Environmental Auditing Work Plan for 2008-2010, which aims to expand the amount of methodology materials that Supreme Audit Institutions can derive benefits from. Therefore, this document has been designed to serve as an aid in conducting audits focused on sustainable energy. In order that the document can be use to all INTOSAI members, it is of a general character.

The Guidance has been written to

- provide useful background information on energy issues;
- be of assistance to auditors preparing audits in the area of sustainable energy;
- provide examples of how audit criteria and audit approach should be determined.

Several case studies illustrate audits of sustainable energy carried out by Supreme Audit Institutions from around the world.

Executive Summary

The issue of sustainable energy is rather complex. Unfortunately, there is no unified explanation on how to understand it. At the same time, Supreme Audit Institutions (SAIs) worldwide have little or no experience in audits concerning sustainable energy. Thus, the aim of the Guidance is to help SAIs to understand issues concerning this topic and to identify a suitable audit approach. The Guidance enables a reader:

- to understand what the sustainable energy issue refers to and what its environmental, economic, and social impacts are;
- to understand governmental responses to this issue (such as policy instruments);
- to choose a suitable audit topic; and
- to design an audit in connection with conditions in the respective country and to form appropriate audit questions.

The Guidance respects the following four steps[1]:

STEP 1
Understand the sustainable energy issue and its influence on society, economy, and the environment

Step 1 aims to identify problematic issues regarding the sustainable energy in the respective country and their impact on society, economy, and the environment. Chapter 1 focuses on Step 1 and gives the reader a basic overview of the most used energy resources and their advantages and drawbacks, as well as of energy consumption, savings, and efficiency.

STEP 2
Understand the governmental response to sustainable energy issues

In this Step, the SAI should answer the questions concerning international agreements/treaties on sustainable energy, policies/programmes regarding the topic, and instruments used to manage the energy policies/programmes. Chapter 2 focuses on this topic.

STEP 3
How to choose audit topics

Based on information obtained in Steps 1 and 2, auditors will identify areas that can be subject to an audit (in the framework of legislative competencies) and specify instruments appropriate for an audit (or that are advisable to audit). Chapter 3 focuses on this issue and shows some approaches to potential topics on sustainable energy. It also contains an analysis of possible risks (risk assessment).

STEP 4
Design the audit

Step 4 introduced in Chapter 4 explains audit planning and preparation of an audit on sustainable energy. An audit logic matrix for performance audit of the sustainable energy issue also forms a part of Step 4.
A logical follow-up of Step 4 is carrying out an audit which is discussed in Chapter 5.

The Annexes provide practical tips, case studies of sustainable energy audits, tips for setting audit criteria from international and national legislation, a guide on how to carry out audits on grants, and a guide on how to cope with the issue analysis. All this information is completed by a general overview on the questionnaire survey we made and an overview on audits carried out in this field up to now.

[1] For explanation of the 4-step process see Guide for Project Leaders: How to develop a Guidance Material in Environmental Auditing, available at www.environmental-auditing.org.

Introduction

In this document, we define sustainable energy as energy which, in its production or consumption, has minimal negative impacts on human health and the healthy functioning of ecosystems, including the global environment, and that can be supplied in a sufficient amount not only to present, but also to future generations without putting a burden on them.

We understand sustainable energy as an issue covering two main fields; the first one is energy generation from renewable energy resources (RERs), and the second one is the most effective and economic use of renewable and non-renewable energy resources.

However, there are a number of obstacles that can hinder progress towards a broader use of sustainable energy, including:

- inadequate and imprecise legislation/policy;
- sometimes high costs for developing, producing, and installing RERs technologies;
- obstacles in access to electricity grid;
- a poorly functioning system of state subsidies for developing and supporting sustainable energy;
- poor awareness on the part of those who could be using RERs;
- insufficient competitiveness of energy from RERs; and
- scepticism of investors in RERs.

Each country should adopt measures to increase the proportion of energy produced from RERs in their energy mix. The broader use of RERs can make it possible to:

- support development of new sectors based on modern technologies;
- alleviate dependency of a country on energy imports from less stable countries;
- mitigate global climate change and atmospheric pollution;
- reduce the consumption of fossil and nuclear fuels; and
- generate new jobs.

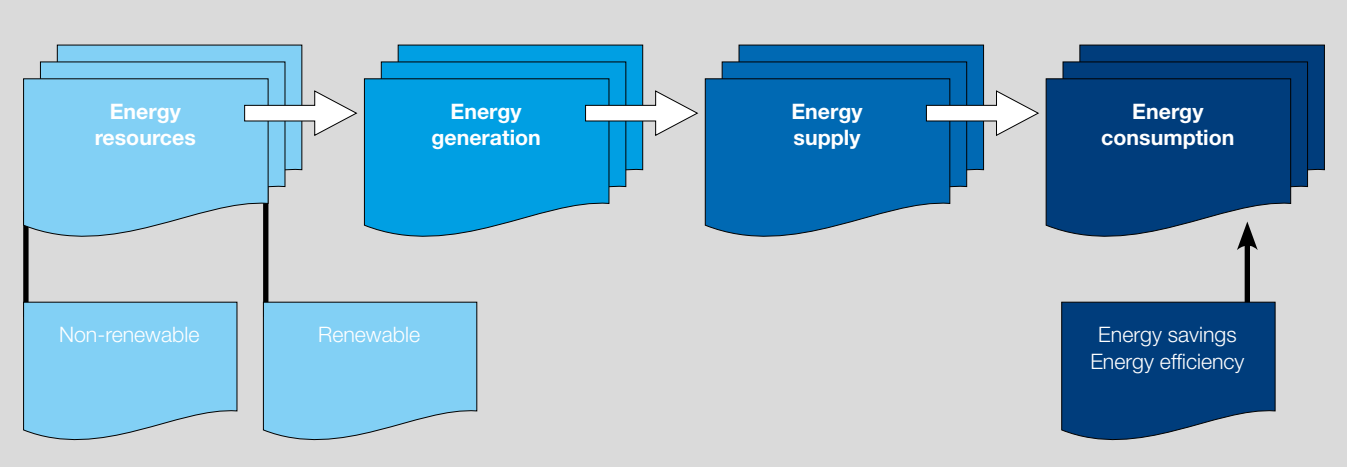
Public funding may be used to promote and expand the sustainable energy field, through direct funding of projects realised and through research and technology development. Thus, it is necessary to review and audit both the management of spending from public funds and the effectiveness of policies and programmes in achieving their stated objectives.

The guide does not cover the transport and transport related policy tools. The transport issues are mentioned only marginally in the parts of the guide where it is appropriate for its logical structure.

Wind farm in Rusová, Czech Republic (© Barbora Zochová)

Chapter 1:
Basic information on energy issues

Exhibit 1
The energy chain



STEP 1
UNDERSTAND THE SUSTAINABLE ENERGY ISSUE AND ITS INFLUENCE ON SOCIETY, ECONOMY, AND THE ENVIRONMENT

It is necessary for auditors to understand the situation of sustainable energy in the specific country they are working in. If an audit in the field of sustainable energy is being planned, the auditor should know the most essential information concerning energy issues. The questions indicated in Chapter 1 will help the auditor to identify these issues.

What energy resources are used in my country?

When a SAI considers auditing their energy sector, the audit team should acquaint themselves with the energy resources in the respective country, and find out about energy generation from these sources. Sub-chapter 1.1 contains a brief description of renewable and non-renewable energy resources with advantages and drawbacks.

1.1
ENERGY RESOURCES

1.1.1
Renewable energy resources

Renewable energy resources include energy of wind, solar and geothermal energy, energy of water, soil, air, biomass, waste etc.

Definitions and restrictions concerning RERs vary from country to country, and also every country holds its own opinion about what kinds of energy resources should be included among RERs. Current practice shows that the global capacity of RERs is underused, because producing energy from RERs is not profitable without any direct government engagement.

An advantage of RERs is that they contribute to the sustainable development of the energy sector. They can be environmentally friendly, can increase energy security, and can reduce countries' energy dependency.

When compared with non-renewable energy resources, RERs also have their drawbacks. The most significant ones are mentioned separately for each type of a RER in the table on the next page.

Biomass

Biomass can be used for heating and water heating, as well as for electric power generation and transport. Specific vegetable species, secondary products, or wastes are used to generate energy.

One possible breakdown of the various types of biomass is by their water content

- dry biomass - wood and waste wood, straw, and other dry residues from the production of agricultural crops, etc.;
- wet biomass - liquid wastes from farming, liquid municipal wastes and refuse. It does not lend itself to direct combustion, and is used especially in biogas technologies;
- special biomass – oil plants, as well as starch and sugar containing plants used to produce biofuels.

Biomass in the form of biofuels can be used for transport. Bio-fuels are an alternative to fuels produced from fossil resources. The starting material for the production of bio-diesel fuel is oil seeds, while bioethanol is produced from plant sugars obtained for example from sugar cane or cereals. The production of second-generation biofuels is planned, where the whole

Rape field (© Michaela Rosecká)

Exhibit 2

Advantages and disadvantages of different types of renewable energy

Basic information on selected RERs

	Advantages	Drawbacks	Site constraints
Biomass	Combustion of purposefully planted biomass does not increase CO_2 emissions in atmosphere. Possibility to use biomass for production of biofuels.	NOx emissions from combustion. Using agricultural land for growing biomass crops.	Need of agricultural land to produce biomass and degradation of arable soil as a consequence. Planting of monocultures.
Hydropower	No CO_2 emissions. No waste generated. Ability to connect quickly to the energy grid.	High investment costs; Environmental impacts – biodiversity harm. Variable operational hours.	Availability of suitably located water resource; Ocean energy demanded coastline infrastructure; Investment in energy grid.
Waste	Direct combustion or production of biogas (also utilizable for transport as biofuel). Part of a waste management.	Greenhouse and dangerous gases emissions. Risk of smell inconvenience.	Location close to waste generation and disposal.
Wind	No CO_2 emissions; No waste generated during operation.	High investment costs; Potential noise; Intermittence of energy generated.	Needs specific wind blow intensity; High investments in energy grid. Necessity of the location accessibility for heavy equipment during construction.
Solar	No CO_2 emissions; No waste generated during operation. Low operational costs.	Used cells are hazardous waste; Dependency on sunshine duration and solar intensity.	Suitable location and orientation needed. Investments in energy grid.
Geothermal Energy	No CO_2 emissions; No waste generated during operation. Energy supply continual.	High installation costs. Possible leaks of toxic volcanic gases.	Greatest efficiency in geologically appropriate locations.

First application(s) Electricity production Heat production Warming water

Source: Inspired by www.grida.no

plant or any residual parts of plants become a source for biofuels production. This will reduce the extent to which the growing of biomass crops displaces arable land, i.e. use of agricultural land that could be used in a more suitable way.

Biomass as a RER has a lot of advantages. For instance, biomass combustion does not increase the level of CO2 emissions in the atmosphere (but it is necessary to replace e.g. harvested trees by new outplanting). Another advantage of biomass is that its combustion can be used e.g. “waste” from agricultures (plants by-products).

Using biomass as a RER also has two potential disadvantages. Growing biomass crops may displace agricultural land that could be used for growing crops for food; more land is used for growing energy crops, deforestation and soil erosion occurs, and the foodstuffs market is affected. Also, combustion of some biofuels can release a high amount of air pollutants into the atmosphere.

Hydropower

The energy of water can be obtained by using its flow (kinetic power) or its pressure (pressure potential head), or also as a combination of both of these at the same time, which is typical for dam hydroelectric power stations. Potential energy originates as a consequence of gravity and depends on a difference in elevation levels. It is also possible to use water heat gradient for energy generation.

Currently, small hydroelectric power stations are being built, largely in place of former watermills and existing dams on smaller water courses. Very simple, and therefore also economically acceptable, microturbine technologies are used when building such small hydroelectric power stations.

Tidal energy uses the regularity of tides to generate energy by placing turbines in the direction of an incoming high tide stream or by periodically filling up and draining coastal basins or lagoons.

Wave energy can be transformed into electricity in various mechanical or pneumatic ways. In most cases, these are still in the experimental stage. It is ideal to install the systems in places where a sea is 40-100 metres deep, as this is where the wave energy is most efficient.

In tropical oceans, the thermal gradient between the water surface and water at a depth of 1 km can be used for obtaining energy (so called OTEC technology - Ocean thermal energy conversion).

The advantage of water energy is, in practice, its inexhaustibility and minimal environmental pollution. Hydroelectric power stations demand minimal servicing and maintenance and they can be operated from a distance. They can be put into operation during several tens of seconds and therefore can be used for covering immediate energy production demands, in particular in energy peak times (it means in time when demand for electricity is increased), and also they can serve as a stand-by power supplies in cases of accidents. Pumped-storage hydroelectric power stations can be also used for compensating energy drops that are caused by wind or solar power plants.

Even though water energy ranks among the most widely used RERs, it also has some drawbacks. Hydroelectric power stations are characterized by high investment costs, particularly in the case of large hydroelectric power stations, and this goes hand in hand with impacts on the environment (such as needing to flood large areas, destroying water systems, decline of biodiversity and possible social effects). The amount of energy generated also can depend on seasonal water flow rate fluctuations (e.g., micro hydroelectric power stations) and so the supply is not always continuous.

Tidal power stations also suffer from another disadvantage: their operational hours are shifted daily by approximately 50 minutes (because of the lunar tidal cycle which takes 24 hours 50 minutes), and therefore they do not always work well with the energy peak times of electricity grids. Also, the sites well-suited for the construction of these power stations are often remote from points where energy is used.

While the potential to use the energy of sea waves is great, a negative aspect is that wave generation depends on the force of wind.

Wind energy

Wind is air in motion caused by unequal heating of the earth’s surface, and is the horizontal component of moving air.

Rotors of turbines driven by streaming air can be used to generate energy. The size of the turbines varies anywhere from small simple turbines fitted onto the roofs of family houses up to individual large turbines with an output power of over 2MW that can be grouped at wind farms (built both on land or at sea).

Wind energy is easy to convert to electric power and does not generate emissions or waste. Electric power from large installations is fed directly to the grid, while small units (e.g. household wind power plants) may serve as local sources of supply.

The main problems with wind turbines are high investment costs and construction being limited to areas with adequate average wind speed. Reservations have also been voiced about the noise generated by the turbines and their domination in the countryside, which can be disturbing. Because energy generated by wind power is intermittent, other energy (e.g. from non-renewable resources), is required as a back-up.

Solar energy

Energy deriving from the sun can be used in two ways. To use solar energy passively means that no further equipment is needed. Solar radiation passing through glass panes or specially adapted facades and roofs of buildings can be put to use. To use solar energy actively means that photothermic or photovoltaic panels are needed. The photothermic panels are used mainly for local hot water heating or for the heating process. The photovoltaic cells serve to directly convert solar radiation to electricity.

The indisputable advantage of solar energy is that there are no emissions and no waste produced during the system’s operation.

A disadvantage of solar energy is that its production has to conform to the alternation of day and night, seasons, geographical locality, and the current meteorological situation influencing the intensity of solar radiation. Storing the generated energy requires costly storage batteries, or alternatively, non-renewable sources are needed on standby. In order to allow for large-scale use of solar energy, it is necessary to develop mainly new methods of effective energy storage and to decrease production costs of photovoltaic panels.

Erupting geyser (© Markéta Nejmanová)

Geothermal energy

Geothermal energy is the energy obtained directly from heat stored deep underground in the form of hot water or steam. Power stations using geothermal energy are often built in volcanic regions where their turbines are driven by the thermal energy of hot steam rising from geysers and hot springs at elevated pressure. Alternatively, use is made of a heat-absorbing medium pumped into boreholes to heat up in the earth's interior, from where it is then pumped back to a heat exchanger on the surface.

The potential for using geothermal energy is very limited from a geographical viewpoint, since it is only appropriate in certain geological locations.

Use of renewable energy resources

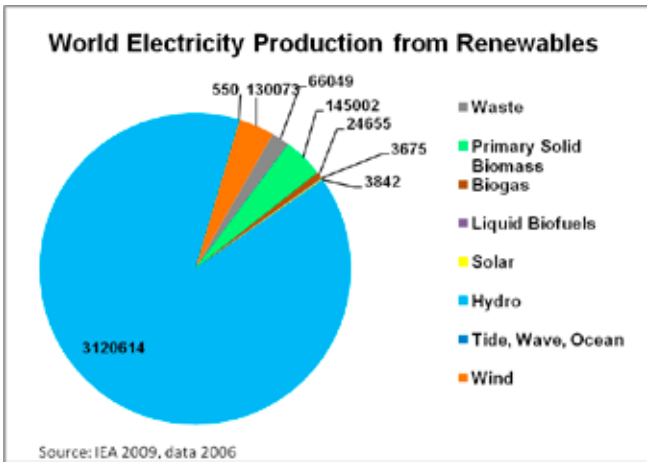
Graphs No. 1 and 2 show the share of world electricity and heat production from RERs. In 2006, RERs generated 3,494,460GWh of electricity (which represent 18% of total world electricity production) and 582,925TJ of heat (which represents 4% of total world heat production).

1.1.2 Non-renewable energy resources

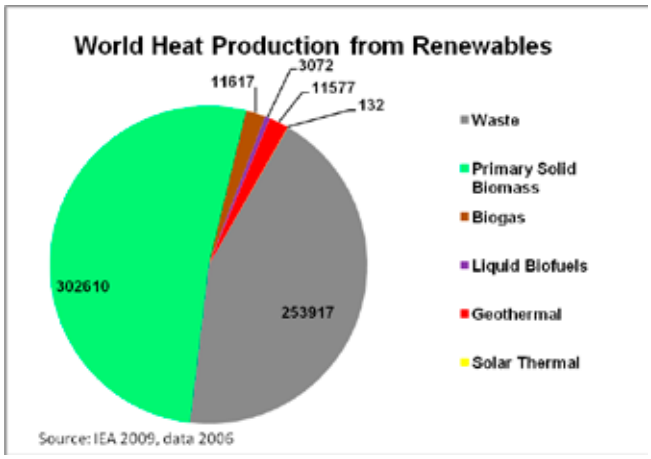
From a global viewpoint, **fossil fuels** cannot be omitted when speaking about sustainable energy. At present, new technologies are being developed that enable higher combustion efficiency and that are more environmentally friendly. Fossil fuels are also the main energy resources used for producing technical equipment that is used to generate energy from RERs.

Fossil fuels are raw materials that took millions of years to form by anaerobic transformation of dead organisms. Fossil fuels include coal, natural gas, and crude oil. The advantages of using fossil fuels include the existence of sophisticated technologies, the availability of infrastructures permitting their widespread use, a developed power transmission grid, and easy transport.

Graph 1
World Electricity Production from RERs in GWh



Graph 2
World Heat Production from RERs in TJ



Temelín nuclear power plant (© Michaela Rosecká)

Among the most significant drawbacks of the fossil fuels are their limited world reserves, and also the CO2 emissions that are generated by fossil fuel combustion. These emissions, according to the opinions of most world climatologists, are the main reason for ongoing climate changes (for more information, see the INTOSAI WGEA publication Auditing Government Response to Climate Change, available on the website www.environmental-auditing.org). Another drawback of fossil fuels is the waste produced during both mining and using the resources (for more see the INTOSAI WGEA publication Auditing Mining: Guidance for Supreme Audit Institutions on the abovementioned website).

Similarly to fossil fuels, **nuclear power** is used to produce technologies for generating energy from RERs. Some countries consider nuclear power to be sustainable energy and some countries strictly reject this approach.

The main drawback of nuclear power is the production of hazardous radioactive wastes that needs to be handled with special care during transport and storage and that remains hazardous for thousands of years. Nuclear power plants pose also a real danger to the population from accidents.

From an environmental viewpoint, nuclear energy possesses the advantage that nuclear power plants are regarded as generally acceptable sources of electric power, because their operation does not produce emissions released to the atmosphere. Compared with a power plant burning fossil fuels, a nuclear power plant consumes a relatively small quantity of primary fuel (uranium, plutonium, and thorium).

What is the situation of energy distribution in my country?

This question refers to the issue of energy supply via an energy transmission grid. Sub-chapter 1.2 discusses this in detail.

1.2 ENERGY SUPPLY

1.2.1 The power transmission grid

Energy generation is only one issue which has to be taken into consideration in the sustainable energy framework. Energy transmission to end users is also substantial.

The transmission networks impose limitations on the transmission of energy. Transmission over greater distances can cause considerable electric power losses, so that transporting power becomes uneconomical.

Transmission losses affect certain types of RERs particularly badly because of their specific location. For example, wind power stations, tidal power stations in the seaside regions, solar power plants in desert areas etc. These RERs may be relatively small and remote; therefore costs to connect them to the distribution network must also be taken into consideration.

Another influencing factor for connecting small RERs might be the ownership of the network.

Also, delivering renewable energy to the distribution network involves limiting factors, such as the availability of the transmission grid and, necessity to build transmission capacity that would cover the maximum (installed) generating capacity of RERs, even though their average output power reaches 10-20% of the total installed generating capacity. In transmission grids, RERs represent only supplementary sources of electrical energy because of their discontinuous operation, while the main transmission network must be supplied by conventional power plants.

1.2.2
Availability and stability in energy supply

The energy generated or imported into a country may be insufficient to meet existing demand or be disrupted by failures in supply contracts, within the generators or on the transmission grid, resulting in power shortages and economic and social consequences. Shortages may also result in payments for failure to provide a service.

Switching station in hydroelectric power station Štěchovice (© Regina Charyparová)

Do I have basic information on energy consumption, energy savings, and energy efficiency?

Sub-chapter 1.3 contains basic information about using energy – energy consumption, energy savings, and energy efficiency.

1.3 ENERGY CONSUMPTION, ENERGY SAVINGS, AND ENERGY EFFICIENCY

In principle, energy is consumed in three basic forms:

- electric energy (this most noble energy can be converted to heat or other forms of energy);
- thermal energy - for heating purposes (heat is required mainly for industrial processes and heating buildings), and also for cooling (air-conditioning);
- by combustion of fuels in transport.

A sizeable share of energy consumption worldwide is taken up by industry, which consumes almost 30-40% of all energy produced. Nearly one third of all energy is consumed in transport. A substantial share (about 25%) of consumed energy is taken up by housing, commercial and public services etc.

Compact fluorescent bulb (© Regina Charyparová)

The main factors influencing the **consumption of energy** are the issues of **energy savings** and of **energy efficiency**.

Selected factors influencing energy consumption

In addition to savings and to raising energy efficiency, it is assumed that the energy consumption trends are and will continue to be influenced by:

- higher living standards as expressed by a greater incidence and variety of new and better performing household appliances, which in may produce energy consumption levels higher than before;
- higher industrial activity that relates to the above item, inasmuch as the industrial equipment required must first be produced, using high amounts of energy;
- raising safety standards (such as higher weight; more resistant materials; standby power supply sources for computer technology; duplicated lines; highways provided with illumination; warning lights at railroad crossings, etc.), adding to consumption and also requiring more energy to be consumed to manufacture such equipment;
- expansion of ICT (such as digital devices in information, communication, and financial services);
- an upswing of the transportation sector – development of environment-friendly mass transport, mainly on railroads (electrification of new line sections), expansion of subway systems and of tramway networks;
- environment-focused projects – remediation of old environmental burdens; modernization of operations no longer commensurate with environmental considerations; moving trucks from road to rail; constructing road and motorway bypasses; driving tunnels – all these representing rather energy-intensive activities;
- higher hygienic and health standards – because of the dramatically increasing strictness of food and health standards the consumption of electrical energy (as well as of other types of energy) is being restructured, with more accent on cooling and freezing, and in the health sector on sterilization and air conditioning.

The principle of **energy savings** lies in the search for and use of technologies and procedures that would reduce the amount of energy consumed to an indispensable minimum. **Energy savings** are understood to represent the amounts of energy saved by adopting specific measures, as determined by comparing to a prior measurement or prior estimate of consumption with a subsequent measurement or estimate taken after the measures have been implemented.

Raising **energy efficiency** represents not only the maximum use of energy generated from primary sources, but also an increase in the ratio between the amount of products, goods, or service obtained and the volume of energy used for this purpose.

Chapter 2:
Understand the governmental response to the sustainable energy issue

This chapter contains an overview of possible government responses to sustainable energy issues tackled in energy policies and programmes, eventually in connection with international agreements and treaties. It also focuses on instruments of energy management policies and programmes and on the economic, social, and environmental impacts of these policies and programmes.

STEP 2
UNDERSTAND THE GOVERNMENTAL RESPONSE TO THE SUSTAINABLE ENERGY ISSUE

The purpose of Step 2 is to help auditors to find potential sources of audit criteria and/or of information and provide an overview of how the government manages and regulates the energy sector in the respective country.

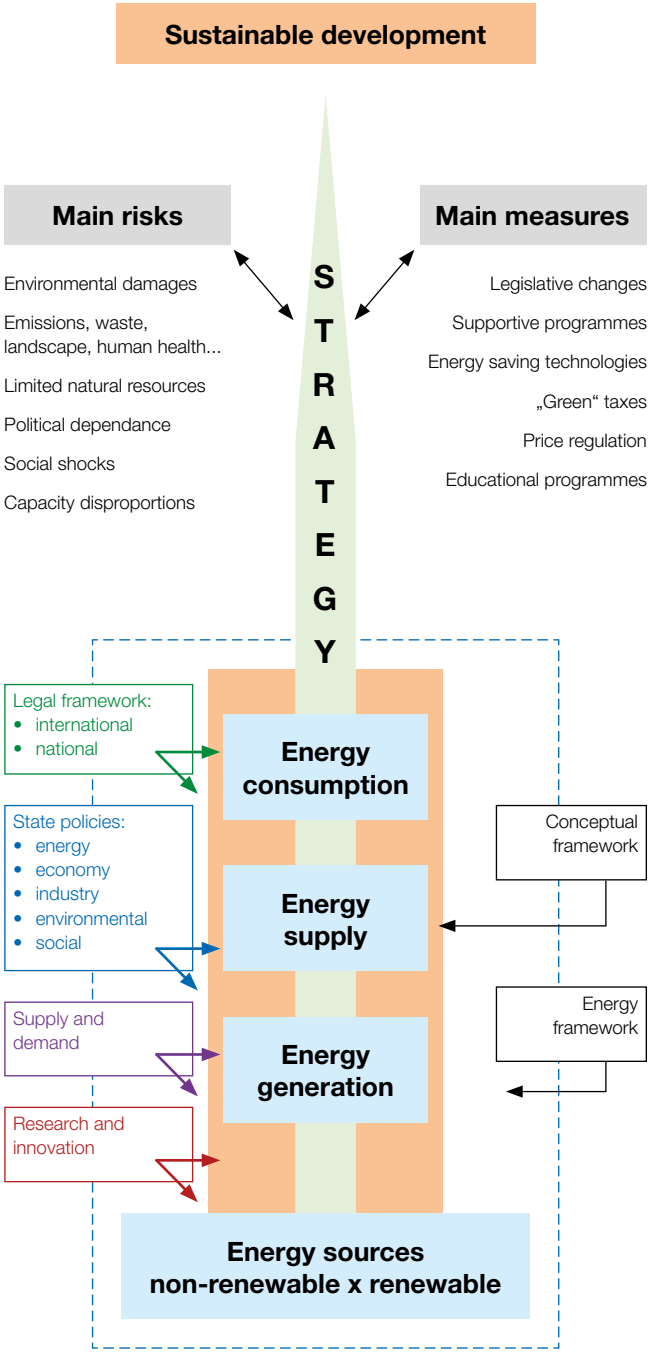
Sources of audit criteria and/or information can be, for instance:

- international Acts;
- the national energy policy and any documents relating to the evaluation of its progress;
- any documentation on the programmes/projects/operations involved;
- the auditees' organization rules – defining the tasks and obligations of the auditees' relevant departments or units;
- the auditee's internal regulations;
- documentation relating to public procurement; and
- accounting.

As far as issues in Step 2 are concerned, the auditors can ask, e.g., the questions indicated in this chapter.

The scheme on the following page describes the energy framework and factors influencing it – from the basic demand and supply principle and influences of research and innovation to factors that regulate the energy framework and create a conceptual framework for its trends towards sustainable development. The conceptual framework is understood here as a set of rules, measures, or policies and its aim is to represent a governmental effort to cover the field of sustainable energy by programmes in all three basic components of an energy system – from production through the transmission grid to energy consumption. The scheme also states the risks of energy frameworks and measures that can be adopted to eliminate those risks.

Exhibit 3
Relation between sustainable development and energy



Are there any provisions following from international agreements or treaties that are obligatory for my country?

Provisions following from international agreements or treaties are a source of audit criteria. Although there are no international agreements/treaties that directly address the area of sustainable energy, SAIs can resort to criteria presented in international agreements or treaties that are indirectly concerned with issues that are relevant to the audit. The most important agreements/treaties are introduced in sub-chapter 2.1.

2.1 INTERNATIONAL AGREEMENTS

The choice of strategy for fulfilling energy policies/programmes depends on the circumstances of each national economy and is mainly influenced by international obligations, the structure of the economy, economic potential, and last but not least by geopolitical conditions.[2]

Governmental energy policies/programmes may during their fulfilment influence financial flows in a significant way and simultaneously divide business risk among individual investors. It is supposed that countries that adopted basic international agreements in energy and environmental fields will implement the international agreements' requests as national energy policies/programmes. These international agreements include:

1. **The United Nations Framework Convention on Climate Change** (UNFCCC, 1992, United Nations Conference on Environment and Development) stipulates a number of general commitments and rules to be observed by the signatory countries. These include e.g.:
   - generating national programmes to mitigate the adverse impacts of climate change and updating these programmes regularly;
   - supporting sustainable systems of managing the economy and systems of nature protection;
   - monitoring, on a regular basis, the amount of emissions of greenhouse gases released into the atmosphere per country;
   - taking account, as a matter of responsibility, of the risks associated with the impacts of climate change when adopting social, economic, and environmental measures, and minimizing such risks;
   - supporting international cooperation in science and technology and supporting educational and training programmes as well as programmes geared to information exchange.

2. **The UNFCCC Kyoto Protocol** sets out binding targets for greenhouse gases emissions mitigation for the European Community and for 37 other countries. The overall aim was to achieve a 5% reduction in greenhouse gas emissions during the five-year period of 2008-2012 when compared to the 1990 levels. However, some countries have not ratified the protocol. The countries that are bound by the Kyoto Protocol to reduce their greenhouse gas emissions have to achieve their respective targets by reducing national emissions. As a supplement, they may use the three flexible mechanisms stipulated in the Kyoto Protocol:
   - trading in emission permits;
   - the clean development mechanism (a mechanism which allows advanced countries to claim emissions credits by investing in emission abatement projects in developing countries);
   - joint implementation (which allows industrialised countries to claim emissions credits by investing in emission abatement projects in another industrialised country).

3. **During the World Summit on Sustainable Development (2002)** in Johannesburg a political declaration was signed which laid down a number of principles regarding sustainable development, and approved an Implementation Plan that presents a detailed roadmap toward achieving sustainable development at international, national, and local levels. The approved Implementation Plan is focused on RERs or on energy resources emitting less CO_2. Its objective is to substantially raise the global share of RERs (however, it does not indicate any time schedule for introducing the RERs).

The commitments resulting from international agreements may be first steps during searching for audit criteria (see Annex No. 2 – Examples of criteria from international agreements). Another significant source of audit criteria is national legislation.

How is the field of sustainable energy regulated by national legislation in my country?

2.2 NATIONAL LEGISLATION

National legislation as a source of audit criteria may include in particular:

- Acts;
  - in the area of environmental protection (e.g., water protection, Environmental Impact Assessment);
  - support to sustainable energy;
  - state budget and the management of state funds;
  - accounting;
  - taxation;
  - public procurement;
- implementing provisions/executive regulation pursuant to Acts;
- governmental policies/programmes in sustainable energy area.

For instance, in the Czech Republic this area is regulated by the Act on the promotion of electricity production from renewable energy resources.

By analogy, e.g. the Chinese SAI makes use of the national Act on renewable energy as a criterion.

[2] **Intergovernmental Panel on Climate Change** (IPCC) in its **Fourth Assessment Report** (2007), which is another important international document that influences sustainable energy issues, summarizes climate change estimates and status of information concerning mitigation and adaptation, and, simultaneously, offers a scientific, technical, and socio-economic outlook for important related topics.

2.3 ENERGY POLICIES/ROGRAMMES AND POSSIBILITIES OF THEIR MANAGEMENT

A government response to environmental issues may be to adopt various energy policies/programmes that define priorities and objectives of the respective country in the sustainable energy area. These government actions represent the next steps in searching for audit criteria.

Does my country have policies/ programmes regarding sustainable energy?

Energy policies/programmes are very important documents which define priorities and objectives of the energy sector. Auditors can, in the framework of their audit activities, check how reality complies with the provisions stated in these policies/programmes (compliance audit), or the efficiency, economy, and effectiveness of these policies/programmes or their components (performance audit). The background information on energy policies/programmes appears in sub-chapter 2.3.1.

2.3.1 Energy policies/programmes

To meet economic development needs and address risks to climate change and energy security, it is a fundamental strategic priority of every national economy to determine a set of measures to effectively use available energy resources. The measures should take the envisaged developments in the areas of energy consumption and energy prices in world markets into account. Thus, it is advisable that medium- and long-term policies will be reflected in countries' legislative frameworks that include regulatory measures and policy instruments to stimulate energy savings and to introduce new technologies.

A characteristic feature common to most national energy policies/programmes is the endeavour to attain the maximum possible degree of self-sufficiency in generating electricity and heat. Some countries' support is mainly directed into regulating the market with a view to maintaining or reducing the prices which the end users have to pay. In other countries the subsidies are mainly channelled in the form of direct payments to support research, development, and innovations in the area of cost-effective low-emission technologies.

The most significant share of the overall support during the 1974–2006 period worldwide was directed at efforts to introduce new, low-emission processes for the combustion of fossil fuels, as well as to higher-efficiency technologies (appliances) with low electric energy consumption and, in OECD countries, above all, to expanding the nuclear power sub-sector.[3]

To address risks to the availability and stability of energy supply, governments' energy policies are likely to actively monitor energy supply and demand and the risk management of the organizations involved to minimize the risk of energy failures. They may also include arrangements for coordinated plans for action to be taken by relevant parties in the event of large scale energy failures. Governments will also routinely forecast energy demand and supply; and review whether appropriate plans and policy measures are in place to support the building of new capacity.

Setting the state energy policy is not an essential condition for performing an audit in sustainable energy.

What to do if my country has no energy policy/programme?

Having no energy policy/programme represents no obstacle to performing an audit of sustainable energy. The audit team must determine other audit criteria following from conditions in the country. Some tips for audit questions are given in the audit logic matrix in Chapter 4.

For instance, the SAI of Canada performed an audit on reducing greenhouse gases emissions during energy production and consumption even though there was no existing federal energy policy in place.

What instrument does my country use to address the environmental impacts of energy production?

Several instruments are developed to contribute to sustainable development in public planning and policy making. Many countries are committed to use these instruments by international or regional agreements and national legislation. When auditing sustainable energy issues, auditors can audit to what extent those instruments are used by governments to analyse and reduce the negative environmental impacts of proposed new energy production; and to reduce the impacts of existing energy production.

Strategic Environmental Assessments

Strategic Environmental Assessment (SEA) is a procedure to ensure that environmental effects are taken into account in decision making on policies, plans and programmes. It requires environmental impacts to be identified, assessed, mitigated and monitored. Results of SEAs are to be communicated at an early stage to decision-makers and to the public, and they should be addressed alongside economic and social considerations. The purpose of SEAs is to identify and consider alternative options so that plans approved can be implemented cost-effectively with lowest consequences possible on the environment.

The use of SEAs might be used to balance between promoting economic development in energy production, energy supply and effective environmental protection.

[3] Source: IEA database R&D expenditure.

Environmental Impact Assessments

Environmental Impact Assessment (EIA) is an assessment of the possible impacts that a proposed project may have on the environment, together with considerations of the natural, social and economic aspects. The purpose of EIA is that decision makers consider the environmental impacts when deciding whether to proceed with a project. It may develop further the findings from a Strategic Environmental Assessment.

Examples of international and regional agreements concerning environmental assessments

- **The Convention on Environmental Impact assessment in a Transboundary Context** (1991, Espoo Convention) sets out the obligations of Parties to carry out an environmental impact assessment of certain activities at an early stage of planning;
- **The Protocol on Strategic Environmental Assessment to the Convention on Environmental Impact Assessment in a Transboundary Context** (2003, the Kiev Protocol) requires its Parties to evaluate the environmental consequences of their official draft plans and programmes;
- **Rio Declaration on Environment and Development** (1992, United Nations Conference on Environment and Development): "In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it" (Principle 4);
- **The European Union Directive 2001/42/EC.** The directive requires national, regional and local authorities in Member States to carry out strategic environmental assessment on certain plans and programmes that they promote. It has no legal status.

The use of SEA and EIA when auditing energy issues

Auditors could check whether international agreements that commit parties to conduct SEAs and EIAs are integrated into national policy and management. The next step is to consider the quality of assessments conducted, and/or whether the results are taken into account in actual decision making. Please note that SEA is a generic tool and may be required under another law, policy or for good practice.

Tips for further reading

- Strategic Environment Assessment Network, http://www.seataskteam.net;
- Strategic Environmental Assessment Network, http://www.sea-info.net/;
- Evolution and Trends in Environmental Auditing, http://www.environmental-auditing.org.

What instruments does my country use to manage the energy policy/ programme?

Based on the overview of instruments used for energy management, the SAI finds out which instruments the government uses in the respective area. More information follows in subchapter 2.3.2.

2.3.2 Instruments used to influence energy management

A. Direct support

Direct support (financial transfers) includes the provision of grants to producers under targeted government programmes, grants to consumers as an incentive to save energy (such as in insulating residential buildings, as well as of buildings constituting part of civic infrastructure or when introducing alternative heating sources), low-interest or interest-free loans from the state budget or from state funds, and so on. Examples can be: investment subsidies toward installing technologies that generate electric power from RERs; capital grants for demonstration projects of energy-saving types of housing, grants in support of expanding research, development and innovations, and grants for educational programmes. An important instrument can be the provision of advantageous (interest-free) loans from funds established by the state for funding environmental improvement measures (for instance, to reduce the energy intensiveness of technologies or buildings).

State programmes

State programmes are understood as a set of priorities, objectives, and conditions that are composed on the basis of needs that arise from long-term outlooks and analyses, and represent financial support instruments through which specific areas of the energy sector can either be supported or not. The above programmes fall within two categories:

Energy-economic programmes encompassing supported areas such as:

- measures to rationalize the ways in which energy is treated and handled;
- cogeneration of electric power and heat;
- emissions abatement measures aimed at the pollution sources;
- power and heat generation from renewable resources;
- raising the share of alternative fuels in the transportation sector;
- measures to reduce heat consumption in office buildings as well as in housing; and
- research, development, and innovation.

Environmental-social programmes go hand in hand with the aforementioned programmes designed to assist the restructuring of the energy sector. Their objective is to mitigate the social impacts on regions resulting from downsizing of coal mining operations, and to deal with the social consequences of employment losses in the energy sector.

Support of research, development, and innovation

This is an area which tends to be dealt with in comprehensive fashion by adopting programmes focused primarily on using energy resources effectively, on RERs, and on power and heat co-generation (for instance, the EU Member States make use of the opportunity provided under the 6th Action Programme in the domain of energy and the Decision No. 1230/2003/EC of the European Parliament and the Council adopting a multi-annual programme for action in the field of energy: "Intelligent Energy – Europe"). As to substance, they not only encompass the research and development of new, low-energy production technologies, electrical appliances, propulsion units and assemblies for transport vehicles, and new construction methods for building structures to minimize heat losses of buildings, but also the dissemination of knowledge and exchange of experience through consultancy agencies, education and training, awareness-raising activities promoting best available techniques, etc.

Investment incentives

Investment incentives constitute one of the forms of public support that can be oriented on energy savings, RERs, power and heat co-generation, as well as higher uses of domestic primary energy sources. Examples are investment incentives for creating new jobs or training/retraining employees, grants of land, eventually sales of technologically equipped facilities for attractive prices etc. A specific support with an indirect impact on enhancing the efficiency of the applicants' energy management can have the form of relief on the income tax over a definite period of time dependent on the level of modernisation of existing production capacities.

B. Indirect support

Indirect support includes: discounts on or waivers of mandatory sanction charges and taxes set out by law (tax on turnover, tax on production); regulation of tariffs; credits toward taxes on investment with deductions of all components of investment costs from tax liability; accelerated depreciation of accruals in assets and stocks; tax on investment; exemptions from customs charges and income taxes; energy tax; reductions of taxes on goods or services (value added tax) and excise duties (e.g. exemption for bio-fuels); limitations on property and income taxes (free-of-charge leases of public land for wind farms, interconnections of distribution networks paid by consumers, etc.).

Environmental aspects of the tax system

The ecological reform of the tax system represents a shift away from taxing labour towards taxing goods and services whose production and consumption exert negative impacts on the environment and on human health.

In its material aspects, environmental tax is concerned, for example, with amending the motor vehicle tax and, in particular, with increasing the excise tax imposed on electric power generated from non-renewable resources. Environmental tax revenues may be used to offer relief on other taxes (such as income tax) or discounted social and healthcare insurance premiums (for instance, when tackling ecological aspects of the tax system the EU Member States are guided by Directive No. 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity, which declares the principle "not to increase the overall tax burden").

On the other hand, environmentally friendly fuels and methods of electricity generation ought to be practically exempt from taxation.

Public Private Partnership

Specific forms of indirect financing can include government participation in Public Private Partnership (PPP) projects.

C. Energy-related services provided directly by government

Governments can invest in energy infrastructure through state-owned business companies or in the form of government procurements expressing the government's support for demonstrations of low-energy projects and RERs, e.g. low energy projects for public buildings, the use of hydrogen fuel cells and solar technologies in public services, technical and technological measures conducive to energy savings in public buildings etc.

D. Regulating the energy sector (price controls and market-access restrictions)

It is possible to apply regulation measures in the energy sector with the assistance of the following instruments:

Price regulation by means of subsidised prices, in addition to price control measures.

Other regulatory measures, for example: imposing constraints on the availability of polluting technologies; reducing the transaction costs; addressing obstacles arising along the supply chain; stimulating competition; taking steps to make the technological innovations markets less uncertain; strategic co-ordination of key energy commodities markets; etc.

Feed-in tariffs are an efficient, flexible, and fast support of fixed prices. Energy policies/programmes stimulate the energy producer to generate electricity from renewable energy sources. Feed-in tariffs are set above the market price so as to cover the cost of the renewable energy resources, and are modified depending on the form in which the renewable energy resources are generated.

Supplier obligations can also be designed to promote renewable energy and constitute an alternative to feed-in tariffs. They may impose requirements on energy suppliers, for example, to source an increasing percentage of the electricity they sell from renewable sources, and can involve the creation of trading markets in green certificates (see below). As with feed-in tariffs, the costs of meeting supplier obligations are met by consumers, not by government.

Net metering or **"net billing"** is an important regulatory measure, which allows those consumers who cover a part of their own consumption by operating a renewable source of electrical energy to deliver (sell off) their instantaneous surplus energy to the distribution network.

Green certificates are tradable certificates for energy generated from renewable sources. The chief prerequisites for purchasing green energy include well-functioning green pricing programmes, competitive retail sales made possible by energy sector liberalisation (green marketing), and voluntary trading in renewable energy certificates. **White certificates** can be awarded if a certain reduction of energy consumption has been attained, and these can also be traded.

E. Energy efficiency and energy savings measures

Energy savings and energy efficiency can, in principle, be broken down into the following areas:

1. energy transformations – an overhaul of power plants and heat generating plants nearing the end of their service life. As a consequence this raises the electric energy generating efficiency, by:
   - increasing combined production of heat and power (so-called co-generation);
   - raising the electric power efficiency and central heat generation efficiency;
   - cutting down the energy losses in transmission and distribution.

2. end-consumers – here the focus of potential savings can be perceived primarily in
   - processing industries, i.a.
     - adopting and implementing measures identified by energy audits;
     - using modern, energy-saving technologies and procedures.
   - in households, i.a.
     - heat insulation of buildings, mitigation heat losses of buildings;

       Properly sealed windows can save 10-15% of operating costs for heating.

     - supporting low-energy and passive housing;
     - using energy-efficient appliances;

       A method has been introduced in all EU Member States that makes it possible to quantify, in a demonstrable manner, the energy consumptions of both appliances and buildings.

     - reducing energy consumption by adopting a more economical standby mode;

       It is expected that, in the EU Member States until 2020, electric power consumption rates of appliances will be reduced to as low as one-fourth of their original consumption rates due to adopting more economical standby modes. Due to throttling down the consumption of these appliances while operated in the standby mode, a potential saving of electric power totalling up to 35 TWh/year across the EU territory is envisaged.

     - suitable placing of electrical appliances;
     - optimum temperature for economical heating;
     - regulating indoor temperature;
     - removing obstacles that hinder free circulation of heat;
     - preventing heat leaks through windows and doors;
     - energy-saving measures applied to the use of warm and cold water;
     - adopting suitable food preparation technologies; and
     - using economical fluorescent lamps instead of incandescent light bulbs.

       An economical compact fluorescent lamp has a service life three times to fifteen times longer and will consume up to 80% less energy than the classical incandescent lamp.

   - in transportation, i.a.
     - supporting public transport;
     - modernizing the fleet of vehicles;

       The use of last-generation compact halogenide discharge tubes which are more efficient energy savers than the sodium discharge tubes. Substantial savings were achieved, for instance, in England and Germany. Thanks to this principle, very high savings can be obtained (up to EUR 2,000 per kilometre of lighted roadway, with an eight-year payback on investment in installing white light illumination).

     - using a “green switch“ for outdoor lighting.

3. Further potential instruments to achieve energy savings, such as:
   - introducing an environmental tax reform;

     Tax relief measures for energy-efficient installations and equipment making use of RERs on one hand; environmental taxation that increases the prices of environmentally-unfriendly forms of energy on another hand.

   - green bonuses;

     Sums increasing the market prices of electricity. These are reimbursed by the regional distribution system or the transmission system operator to those generators who produce electricity from RERs, in consideration of the reduction of damage to the environment by using a renewable source of energy instead of combustion of fossil fuels, or in consideration of the type and size of generating equipment and, thus, the quality of the electricity generated.

   - guarantees extended in respect of payback on investment;
   - monitoring and targeting;

     An effective method of managing energy consumption. This represents a combination of monitoring (following up the consumption of energy) and targeting as an analysis of the results achieved from the point of view of the pre-set energy consumption target. This method is based on a systematic monitoring of the actual energy consumption, an analysis of the results obtained, and a subsequent implementation of remedial measures. Energy savings are achieved based on low-cost measures. This method can be introduced at a relatively low level of investment which routinely pays back within 12 months.

- information and awareness-raising campaigns;
- educational activities focused on school establishments; and
- technologically more exacting methods of production which at the same time are more friendly toward the environment.

Ranking among the ways of cutting down energy consumption are new technologies capable of bringing in energy savings. In advanced countries, society invests in research and development since customers often realize that the low energy consumption is more important to them than the price itself.

F. Other instruments

The trend of development of the energy sector can also be significantly influenced by economic instruments. For example, **trading in unspent greenhouse gases emissions limits** is one such instrument. For this economic instrument to be implemented by the different signatories of the Kyoto Protocol, it is indispensable that the terms and conditions of the emission trading system are given firm bounds by national legislation. The methods of determining, reporting, and verifying the overall amounts of the emissions are determined by the rules and guidelines of the UNFCCC Secretariat. In addition to emissions trading under the Kyoto Protocol, the European Union has implemented its own trading system. Also, some countries have national emissions trading systems.

From the point of view of greenhouse gases emissions abatement, the key element of the system is the national allocation plan which sets out the method for how the emissions permits for a given period of time will be allocated to businesses, together with the amounts to be allocated. Legislative links between the trading system and the flexible Kyoto mechanisms is also necessary. A desirable end effect of the trading transactions would be a re-allocation of the revenues from sales of the emissions permits to the area focused on the abatement of those greenhouse gases emissions.

Emission trading and taxes as policy instruments are further explained in the INTOSAI WGEA publication Auditing Government Response to Climate Change, available on www.environmental-auditing.org.

What are the possible effects of energy policies in my country?

Like other policy areas, instruments to deliver energy policies can have a wide range of intended and unintended economic, social and environmental impacts.

2.3.3 Economic, social, and environmental impacts of energy policies

Direct financial support can overcome economic barriers and support innovation. Public funding can stimulate the economy but, by adding to public spending and the state's burden of debt, may increase macroeconomic costs. The cost-effectiveness of public funding needs to be considered against alternative use of the funding. The potentially beneficial additional effects from supporting sustainable energy, such as job generation and additional social benefits to consumers by supporting sustainable energy measures directly in their homes, such as more efficient boilers or better insulation, need to be considered. The level of funding needs to be judged in comparison to both the costs involved and the level needed to achieve the intended outcome. Consideration also needs to be given to whether the support has crowded out more efficient private investment or added to private profits.

Direct financial support that results in energy prices being below what they would otherwise have been may encourage an increase in energy consumption. Differences in energy prices between neighbouring countries can also distort production and consumption patterns.

Taxes or trading schemes uniformly applied can create incentives to reduce the taxable goods. For example, taxes on emissions encourage investments to reduce them. Carbon emissions trading can create a market in carbon and contribute to efficient decisions across industry on least cost abatement. If taxes fall differentially on different businesses they can, however, affect competitiveness.

Taxes increase costs to consumers. This may encourage investment in energy-saving equipment and installations. However, energy costs can be disproportionate to low-income households and so rising prices can increase the numbers of "fuel poor" households who cannot afford to warm their homes and may make disproportionate calls on other public social or health services. Fuel poor households may also not have the funds to invest in energy saving devices.

Price support, for example through feed-in tariffs or through supplier obligations, increases costs to consumers in the same way as taxes. However, there is no direct financial engagement by the national treasury. As with direct support, it is important to consider the rates set and whether it has achieved the intended effect or distorted incentives in unintended ways.

Revenues deriving from taxes and charges, however, add to public funds and can be used to bolster public financing of other measures.

Regulation can stimulate innovation by reducing the uncertainty faced by innovators, stimulating the process of introducing new technologies by reducing the overall costs, lowering the trading risks of business undertakings and cutting down the technological costs (thus unburdening the economic system), and influencing more effective market outputs (buildings, transport, and energy).

Transmission lines, Morocco (© Regina Charyparová)

But where regulation determines product or service specifications, it may also increase prices and inhibit the take-up of beneficial, but lower specification, products and services. It may therefore, like taxes, reduce the living standards of low-income households by imposing a higher cost on the consumer.

Policy instruments of any sort, whether direct support, taxes, or regulations, may involve considerable accounting and transactional costs on the industry or on the state budget. Aspects of policy design can minimise compliance costs and bureaucratic costs.

In theory, support offered at a level which reflects environmental costs and externalities will produce an efficient outcome. However, in practice it is very difficult to determine the value of environmental costs and benefits to current and future generations. In practice, support levels may need to be determined with reference to evidence on its take-up, as there will be non-economic barriers to investment which the support will also have to overcome, such as the cost of capital, the cost of risk and the cost to applicants of engaging with the scheme. Governments may be able to address some of the barriers directly, for example by changing planning laws or extending the period of the commitment to provide support to reduce the risk to investors.

Who are the main players in the energy sector in my country and what are their roles and responsibilities?

The field of sustainable energy is rather complicated. Many subjects play a role in the energy sector to a greater or lesser extent. The audit team determines auditees with regard to conditions in the respective country, e.g. who regulates the energy sector (ministries, regulating agencies and so on), who is the owner of the transmission grid (public or private ownership). etc.

Chapter 3:
Approach to choosing audit topics

The choice of an appropriate audit topic is a main decision of a SAI when preparing an audit. The decision should be made on the basis of an assessment of the situation in the field of sustainable energy (see Chapter 1). Consequently, the SAI verifies how this field is regulated by international agreements (which are binding for the respective country) and by national legislation. Based on the overview of instruments used for energy management, the SAI finds out which instruments the government uses in the respective area (see Chapter 2).

After the evaluation of previous steps, the SAI subsequently decides which areas of sustainable energy will be audited.

STEP 3: HOW TO CHOOSE AUDIT TOPICS

The audit team defines the audit topic based on the risks and materiality related to sustainable energy issues described in previous steps.

Examples of sustainable energy areas already audited by some SAIs

- state (national) energy programmes (the Czech Republic);
- the system of support focused on RERs (the United Kingdom);
- elimination of barriers to further expansion of the use of RERs (the USA);
- the system of electricity supply (Hungary, Australia);
- activities pursued to boost energy efficiency (Estonia);
- government activities to eliminate large power failures (Sweden);
- regulation in the energy sector (Portugal);
- support of research and development in the area of sustainable energy (Morocco); and
- energy savings (the Czech Republic).

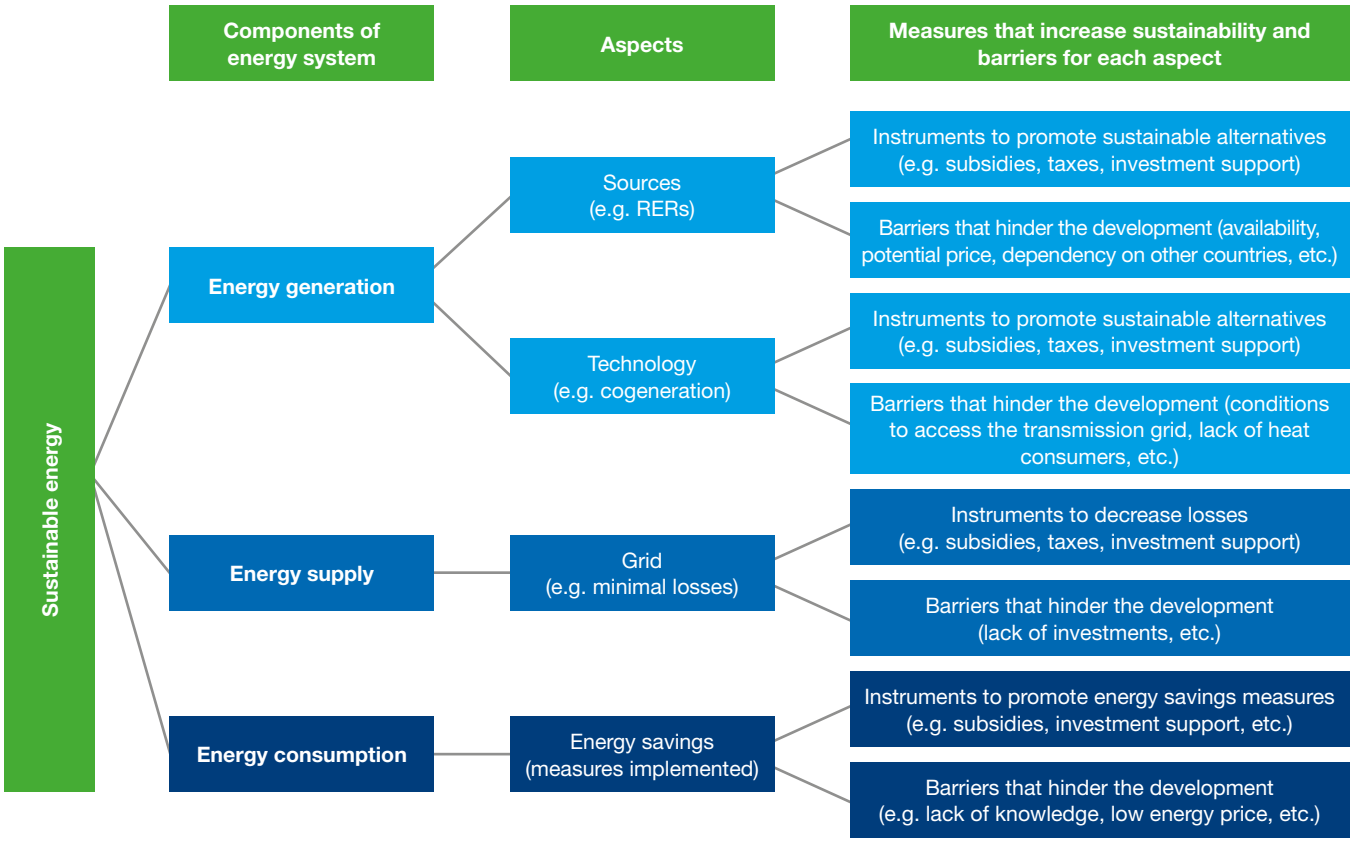
Jazani Forest, Zanzibar (© Regina Charyparová)

How to choose an audit topic on sustainable energy?

There are many possibilities about how to approach to the field of sustainable energy (see also the Exhibit 4→). Audits can be:

- energy sector oriented (e.g., cover the issue of energy generation, supply, or consumption, or all three);
- aspect oriented (different aspects might include promotion of renewable energy, energy savings; etc.); or
- oriented to measure increasing sustainability (e.g., programmes, policies, etc.).

Exhibit 4
Example scheme for choosing an audit topic on sustainable energy



The next part considers various approaches to choosing an audit topic in the framework of individual parts of sustainable energy (energy generation, energy transmission, and energy consumption).

What to focus on when auditing energy generation instruments?

In the framework of this component of sustainable energy, the following **instruments** can be audited:

- direct support (state programmes and measures; support of research, development and innovation; investment incentives, etc.);
- indirect support (state measures; tax system; PPP; trade restrictions, etc.); or

- regulation of the energy sector (price regulation; feed-in tariff, etc.).

Among possible **barriers** that restrain energy being generated from RERs are: availability, potential, purchase costs, dependence on other countries, etc.

- specification of the programme objectives and their compliance with the strategic objectives of the state energy policy/programme, together with the objectives defined for sustainable development by the state environmental policy (assessment of impacts, e.g. on ecosystems, human health, etc.);

For instance, when auditing the **state programmes**, a SAI may audit the following aspects of the programmes

- quantifying the needs, and the ways of satisfying such needs, from available government sources, with participation of resources from private sector funding (financing, capacity, time allocation, etc.);
- setting up steering documents for the programmes encompassing adequate project selection criteria and the conditions of their transparent evaluation from the aspects of the programmes' projected benefits;
- quantitative and qualitative characteristics of the programming priorities defined by means of monitoring indicators for the programmes that lend themselves to measurement and evaluation;
- setting up efficient internal control and audit systems by the administrators of the programmes;
- various levels of monitoring, progress evaluations, and reporting.

For instance, when auditing the **support for research, development, and innovations,** the following items have to be given particular consideration

- specification of programme targets and their compliance with the strategic objectives of the state energy policy/programme;
- compliance of support provided to research and development projects with pertinent national legislation;
- support extended to research centres, information infrastructure, and international cooperation programmes;
- programme support and its links to pre-set target evaluation indicators; and transparency of project selection; and
- in specific projects, the links between project targets and programme priorities, monitoring and evaluation of benefits, and adherence to the terms and conditions under which state support was granted.

For instance, when auditing the **tax system**, in particular, it can be reviewed whether

- the legislative amendments are consistently and effectively conducive to stimulating the resolution of the problems identified; and
- the principles and the time schedule of the environmentally friendly tax reform were observed.
- evaluate the adopted price regulation and adapt flexibly the regulatory framework so as to correspond with the required market developments of the prices of various forms of energy;
- adopt appropriate measures necessary for harmonizing the legislation required for opening the energy market to international trading;
- have not adopted excessive regulation, thereby according priority to the dominant position of the country's own producers while excluding their foreign competitors; and
- have standardized the system for disclosing the comprehensive energy-related information and public discussion of this information.

For instance, when auditing **regulation of energy prices**, in particular, it can be reviewed whether the government and relevant authorities

What to focus on when auditing energy supply instruments?

In the case of energy supply, these **instruments** are auditable

- direct support (state programmes and measures, support of research, development and innovation, investment incentives etc.); and
- indirect support (state measures, PPP etc.).

The main **barrier** in the field of energy supply could be lack of investments to the infrastructure.

For instance, when auditing **the investment incentives**, in particular, it can be reviewed whether

- the procedure adopted by the executive bodies is in compliance with national legislation and with accepted international commitments (amount of support, transparency of selection, etc.);
- the application for support as submitted by the applicant has complied with the terms and conditions set out by the executive bodies for the implementation of the project;
- any material changes to the project and project supplements were justified and whether the pre-set deadlines and other terms and conditions were adhered to; and
- the end-of-project parameters attained by the investment are commensurate with the planned parameters (including e.g. its effect on territory, landscape, and population).

For instance, when auditing **PPP projects** it can be reviewed whether

- executive bodies proceed in compliance with national and international legislation (transparency of selection, proving PPP efficiency in comparison to classic order);
- any material changes to the project and project supplements required by the public sector were justified (the private sector can get changes only in a competitive/concession dialogue) and whether consequences for further project were drawn;
- all pre-set deadlines, projects parameters and term of the contract were adhered to;
- the public sector regularly checks contract performance during a PPP project and whether it evaluates its efficiency;

- the public sector has at its disposal all information necessary for evaluation of contract efficiency; and
- the eventual prices/fees alteration was done in accord with pre-set conditions.

For instance, when auditing **measures to ensure availability and stability in energy supply** it can be reviewed whether

- the arrangements for managing the transmission grid optimise energy supply and reduce the length of blackouts; and
- there is preparedness for handling power failure.

What to focus on when auditing energy consumption instruments?

The field of energy consumption, which is influenced by energy savings and efficiency (see sub-chapter 1.3), can be covered by these **instruments**:

- direct support (e.g. state programmes or measures, support of research, development and innovation, investment incentives etc.);
- indirect support (tax systems, etc.); and
- regulation of energy sector (price regulation, etc.).

For instance, when auditing the **programmes relating to energy consumption issues**, in particular, it can be reviewed whether

- the energy consumption/savings/efficiency issues constitute a part of an adopted energy policy/programme (if it was adopted at all);
- the relevant document sets out requirements that would call for specific ways and means of reducing energy consumption/ achieving energy savings - for instance, implementing more advanced, less energy intensive technologies, investing in research and development of such technologies, etc.;
- it has been laid down in what ways and to what extent the pre-set requirements relating to energy consumption, savings or efficiency will be implemented and kept within defined bounds;
- these requirements have been complied with by the commercial undertakings acting as energy consumers;
- any transportation strategies are being set up and implemented;
- the production and use of biofuels in transportation (both private and public) are supported;
- the generators have become involved in the process of developing new technologies and less energy-intensive equipment;
- households and/or energy distributors have been motivated and become involved in energy savings; and
- the increase in energy efficiency has been achieved at the level of the end consumer because of technological or economic changes or as a consequence of human behaviour.

How should I deal with risks while choosing the audit topic?

A risk is understood as the probability of an event or activity causing a failure in fulfilling set objectives. Identification of risks, their knowledge and management are the key factors influencing both the success of examined programmes/projects/operations and also the activity of a SAI.

Reviewing the risk analysis existence of an auditee

The SAI checks if a potential auditee has elaborated its own risk analysis of the audited sustainable energy field. Specifics of individual countries influence the number and extent of risks as regards individual aspects of an energy system.

Furthermore, the SAI finds out what kind of risks have been identified in the selected area and how they have been assessed for the probability of realization and effect (risk assessment).

A finding if measures for identified risk management have been proposed should be also a part of this assessment.

Risk analysis of a planned audit

The SAI can work out its own risk analysis to verify the feasibility of the chosen audit topic and of defined key questions. This analysis is usually a part of a preliminary study of a performance audit. The requirements for a risk analysis are similar in regards to the procedure described in the previous paragraph related to the risk analysis of a potential auditee.

Risks identified in the phase of a preliminary study can be

- **external**
  - nature and complexity of the national energy policy or of individual programmes/projects/operations;
  - non-existence of energy policies/programmes;
  - diversity, discrepancy, discontinuity, and dubiousness of the national energy policy objectives;
  - non-existence or non-use of appropriate performance indicators;
  - inadequate provisions for securing the required funds;
  - complex organizational structure of the relevant responsible agencies or departments and equivocal distribution of responsibilities;
  - non-existence and insufficient quality of internal control system.
- **internal**
  - lack of know-how (lack of competent auditors) at a SAI with respect to specific topic requirements;
  - audit costs exceed expected income; and
  - time limitation with respect to utilization of the SAI's human resources.

Chapter 4:
How to design the audit

Audits focused on the field of sustainable energy are issue-specific environmental audits. They can involve all kinds of audits, depending on the conditions in the given country and on its experience. The procedure of audit preparation conducted in this field can also draw upon the INTOSAI auditing guidelines, e.g. ISSAI 5130 Sustainable Development: The Role of Supreme Audit Institutions.[4]

There has not been much experience with audits conducted specifically in the field of sustainable energy yet. A questionnaire-based study identified that many SAIs have not encountered them at all (see Annex No. 6 – Summary of information from the questionnaire survey (the "questionnaire survey"). This is why we present more general recommendations for conducting audits focused on this field, based on general principles and on the experience of selected SAIs. These recommendations are not intended as a strict set of instructions; rather, they should provide inspiration for individual SAIs to adapt them to suit the conditions and legislation of their particular country.

This chapter presents a phase-by-phase description of how a SAI should proceed and what it should assess in order to design an audit focused on the field of sustainable energy.

STEP 4
DESIGN THE AUDIT

The aim of the planning phase is for a SAI to arrive at a decision on whether or not to carry out an audit in the area of sustainable energy and how to prepare a detailed audit procedure. The audit procedure should be detailed, so as to cover how to carry out the audit of all types of auditees (support providers; intermediary bodies; support beneficiaries – see the example shown in Annex No. 4 – Guide for carrying out audits on grants).

The planning phase is based on the fact that a need has arisen or that a request has been made to carry out an audit focused on a sustainable energy issue. Such a need can arise as a result of follow-up (monitoring) and evaluation by the SAI of state activities on a topic of primary importance. Alternatively, the audit may be started because of a request from competent bodies (such as the government, the national parliament, etc.) or the public, or it may ensue from international commitments (see sub-chapter 2.1).

Audit preparation can proceed as soon as the SAI has obtained direct access to the auditee's documents, data, and information. In the case of a performance audit, the SAI can set up its own audit logic matrix, as a supporting instrument for defining the audit procedure (see the audit logic matrix in Chapter 4).

Some SAIs deal with these issues within the framework of a preliminary study.

Planning and preparation phases can be executed even before the audit is begun (depending on conditions at the given SAI).

Audit planning and preparation

Key areas

- assessment of the SAI's mandate to perform audits in the area of sustainable energy;
- determining the sustainable energy issue to be audited;
- setting out the audit objective and the auditable subjects;
- determining the framework scope of the audit;
- assessment of audit effectiveness and decision on conducting an audit in the determined field;
- getting acquainted with the audit environment, detailed identification of the range of issues to be audited;
- identification of the auditees;
- choosing the main audit criteria for compliance audit;
- choosing the main audit criteria for performance evaluation;
- choosing audit questions and method suitable for ascertaining and analyzing the information required to assess the real situation (audit logic matrix).

Does the SAI in my country have the mandate for conducting an audit focused on a sustainable energy issue based on an identified need or a request?

First of all, the SAI concerned has to determine whether or not it has the legal mandate to conduct the audit in question. The scope of this authorization ought to be regulated by pertinent legislation. It depends on the mandate accorded to the SAI whether it may, within the framework of its strategy, carry out an audit in the field of sustainable energy, and what the form and scope of this audit should be.

[4] www.issai.org

The questionnaire survey revealed that lacking a suitable mandate poses a problem when conducting audits focused on the field of sustainable energy.

For instance, the SAIs of Poland, Slovenia, and Ukraine indicated this fact as representing a constraint on their auditing activities.

In the Czech Republic, the SAI is unable to audit the steps taken in the field of sustainable energy by the Czech Republic's largest energy corporation, in spite of the fact that the state itself is that corporation's shareholder. The legislation that spells out the SAI's mandate fails to specify an authorization for the SAI to this effect. In the Czech Republic, when auditing the said corporation, the SAI can merely audit the funding received by the energy corporation from the budget of the Czech Republic or from the EU budget.

The SAI should answer the following sub-questions, e.g.:

- Has the SAI's mandate to conduct audits focused on sustainable energy been laid down by an Act of law?
- Has the SAI been accorded the right to conduct audits about the emergence and implementation of national policies and into the measures taken and programmes adopted by the country's central authorities, or even to auditing the decisions made by the government?
- Is the SAI entitled to directly audit how the state is meeting commitments arising from international treaties or the national energy policy, or can it only review these commitments by auditing the system of distribution and spending the funds earmarked for supporting sustainable energy issues?
- Can the SAI conduct audits of all the instruments employed in the management of the state energy policy in the field of sustainable energy (direct subsidies; indirect subsidies; energy-related services provided by the government; regulation of the energy sector; other instruments)?
- Is the SAI entitled to audit all the potential auditees (depending on the auditee's legal form/status)?

Can the SAI in my country determine the sustainable energy issue to be audited based on an identified need or a request?

If the SAI has a legal mandate to conduct audits focused on the field of sustainable energy, it will assess, based on the conditions in the given state, which suitable topics (areas of sustainable energy) potentially come into consideration for auditing (see Chapter 3).

The SAI should answer the following sub-questions, e.g.:

- Is the state under an obligation to meet the stipulations of international agreements in the field of sustainable energy?
- Are there any commitments and obligations to be met by the state arising from international agreements in the field of sustainable energy?
- Has the state (its government) reflected the fulfilment of these obligations in the relevant national energy policy concerned with sustainable energy issues, and has it been transposed to its national legislation?
- Does the national energy policy set out any priorities and objectives? Has the national energy policy stipulated any given field of sustainable energy as a top-priority area?
- Does the national energy policy specify any instruments, including financial resources, as instruments serving to fulfil the tasks adopted, or does it specify the ways in which these resources are to be ensured?
- Has the SAI carried out an assessment of importance of the sustainable energy issue picked for auditing?
- Are there adequate conditions at the given SAI (personnel, financial, technical, availability of external experts, etc.) for conducting audits focused on the field of sustainable energy?

The fact that the lack of auditors suitably qualified for conducting audits focused on sustainable energy issues poses a substantial problem is confirmed by information gathered from SAIs that took part in the questionnaire survey. It has been identified as one of the problems affecting auditing activity by the SAIs of Estonia, the USA, Brazil, Poland, and others. This is also the reason why some SAIs have been resorting to using external experts in their audits (for instance, the SAIs of United Kingdom and Norway).

- Does the SAI have access to any required and relevant information and to reliable data on the area potentially to be audited?
- Has the SAI sufficient information available to properly evaluate what the suitable timing for the audit would be?
- Has the SAI sufficient information available on the potential area to be audited so that it can properly assess the risks if any associated with the performance of the audit?

In many cases, the audit involves several areas of sustainable energy which may be interconnected.

What are the most relevant audit objectives and auditees?

The SAI should define the audit objectives by setting out what should be achieved by the audit and who the auditees are (the government represented by the relevant ministry; government organizations; a state fund; a non-governmental organization; beneficiaries of subsidies, etc.).

An audit focused on sustainable energy may evaluate this area from various perspectives, such as:

At the providers of subsidies:

- whether the relevant programmes/projects/measures are being elaborated in compliance with applicable regulations (compliance audit); and
- whether the programmes/projects/measures have been adjusted, managed, and implemented in an economical, effective, and efficient manner (performance audits).

At the beneficiaries of subsidies:

- whether the beneficiary of a subsidy while implementing a given project has proceeded in compliance with applicable

legislation and with the provider's terms and conditions (compliance audit); and
- whether it has implemented the project under scrutiny in an economical, effective, and efficient manner and has met the pre-set targets and indicators (performance audits).

Can the SAI in my country determine the framework scope of the audit?

The SAI should specify the framework of the audit and its schedule, i.e.:

- what time period will be audited; and
- to what extent the sustainable energy issue will be audited.

Further, the SAI has to decide on:

- the form of the audit, i.e.:
  - whether the audit would be conducted by the SAI alone;
  - in cooperation with other SAIs (as a coordinated, parallel, or joint audit); or
  - with the assistance of external experts; and
- the type of the audit.

During this phase, some actions can be started, such as preliminary analysis of the audit's feasibility, analysis of potential risks, SWOT analysis, and/or problem analysis.

What is the audit effectiveness and decision on actually performing the audit of the given area?

In this step the SAI should evaluate:

- Will the planned audit be effective, or will the potential costs of the audit exceed its expected benefits?
- Is the chosen topic important enough to be incorporated into the audit plan?

The audit planning process should result in producing a document (according to the habits and conditions of the respective SAI) that will eventually be approved by the SAI management and according to which the audit will be included in the audit plan for the given year.

Does my audit team have sufficient information on the audit environment? Has my audit team performed a detailed identification of the range of issues to be audited?

The SAI should answer the following sub-questions, e.g.:

- Does the auditee's organizational structure correspond with the requirements and needs resulting from the tasks assigned to the auditee in the field of sustainable energy?

For instance, in the Czech Republic, one of the auditees is the Ministry of the Environment where a special Department of Sustainable Energy Production and Transportation is charged with the responsibility of dealing with sustainable energy issues.

- Has the auditee unequivocally defined the responsibility for tasks performance in the field of sustainable energy and assigned it to relevant departments (organization rules, internal guidelines)?
- Has the auditee set up and elaborated (with sufficient detail) an internal control system focused on the area of sustainable energy?
- Are the existing internal control mechanisms operational, efficient, and effective?
- Is the existing internal audit system capable of detecting and describing the risks occurring in the field of sustainable energy?
- Does the auditee's management have sufficient information available on the progress of its tasks in the field of sustainable energy? That is, has it adopted measures to deal with any problems that might appear and any deficiencies that might be detected by the internal control system?

How does my audit team identify the auditees in my country?

In connection with the information ascertained during the audit preparation phase the SAI should answer the following sub-questions, e.g.:

- What criteria should be chosen by the SAI to select the auditees (such as the type of support provided; the type of renewable resource under scrutiny; the volume of support; the auditees' geographic distribution; the auditees' legal form; and the number of auditees in relation to the SAI's auditing capacity)?

For instance, the SAI of the Czech Republic has employed the following criteria when picking the beneficiaries of support as auditees: the type of renewable energy resource involved; the volume of support provided; the auditees' legal form; etc.

- Has the audit team finalized the list of auditees (for example, by including the beneficiaries of support)?

What are the main audit criteria for compliance audit?

Criteria for compliance audit

One of the basic audit types is auditing the compliance with legislation. The audit scopes may differ for SAIs depending on their legislative/constitutional competencies. The audit team will also find it useful to examine legal norms for criteria applicable to the evaluation of the auditees' audited activities.

The procedure used to determine the criteria for audits focused on sustainable energy is linked with the section on the determination of the audit subject and objectives.

When determining the subject and objectives of an audit, the SAI concerned also has to decide which economic instruments of support for the sustainable energy will be included in the audit scope (compare, for instance, Chapter 3).

The most frequent type of audit focused on the field of sustainable energy is often the audit of subsidies provided by the state or of foreign funds channelled directly to the various beneficiaries.

When choosing the criteria, the SAI in question should select those regulations that exert significant effects from the point of view of the sustainable energy area under scrutiny and from the point of view of the audit objectives. The SAI should use the detailed information about the auditee's duties stated in legislation. The sources of criteria may include, in particular:

- international treaties/agreements;
- Acts;
- implementing provisions of Acts;
- government energy policy;
- any documentation related to programmes/projects/measures in support of the sustainable energy field under scrutiny (the terms and conditions under which the support has been provided); and
- decisions or agreements/contracts on the provision of support to a specific beneficiary.

The SAI should answer the following basic sub-questions relating to the definition of the audit criteria in the field of sustainable energy:

- Can the SAI use international treaties and agreements for its criteria?
- Have any generally binding legislative norms (Acts, implementing provisions of Acts) regulating the issues of support to the area of sustainable energy been adopted by the given state?
- Are there any further documents in existence relevant for the audited field of sustainable energy that could be used to set the criteria (e.g., government policies, support programmes, decisions, or contracts/agreements on the provision of support)?

International treaties/agreements as a source of criteria applicable to sustainable energy audits

Observance of commitments arising from international agreements may also become the subject of parallel, coordinated, and joint audits conducted by SAIs. As an auxiliary instrument, the INTOSAI standards such as ISSAI 5140[5] dealing with these issues can be consulted.

An important factor to be considered when resorting to international agreements as a source of criteria is their binding character, owing to the fact that the number of parties to the agreement is limited by the number of signatory states that have ratified the given international agreement.

No international agreement of global validity has been concluded until now that would directly address the area of support to sustainable energy. Thus, from the point of view of appropriate audit, or of the audited area of sustainable energy, the SAIs can resort to criteria presented in international treaties or agreements indirectly concerned with the issues of relevance to the audits (see Annex No. 2 Examples of criteria from international agreements).

National legislation as a fundamental source of criteria

In addition to international agreements viewed as sources of these criteria, another such source of criteria is represented by the national legislation.[6]

The following types of national legislation, which regulate in the described areas, are well-suited for sustainable energy audits:

- environmental legislation;
- support to sustainable energy;
- state budget and the management of state funds;
- accounting;
- taxation; and
- public procurement.

Also, considerable attention has to be given to the selection of suitable criteria because not all states have special Acts in force regulating the field of sustainable energy.

For instance, the SAI of Sweden has specified the relevant EU regulation as its main criterion for audits (for more details, see the case study appended as Annex No. 1 Case studies on audits performed).

What are the main audit criteria for performance evaluation in my country?

Performance evaluation criteria

A performance audit has the performance requirements or standards as its audit criteria. Based on these requirements or standards, it compares and evaluates the adequacy of systems and procedures, as well as the economy, effectiveness, and efficiency of the activities performed.

They are determined in order to be able to assess the true activity of the auditee and to formulate a description of the facts ascertained and the shortcomings detected.

The performance audit criteria should be unbiased, adequate, attainable, and clearly interpreted. The reasons why the criteria were selected as well as their importance should be known.

These criteria have to be set in relation to the subject of the audit at hand, and this is why different performance audits may employ different criteria.

[5] ISSAI 5140: How SAIs may co-operate on the audit of international environmental accords, www.issai.org
[6] For Member states of the EU, the EU legislation is also implemented in the national legislation – see Annex No. 3 – Examples of criteria from EU legislation.

Dam reservoir, Wadi Mujib, Jordan (© Regina Charyparová)

The criteria applied in performance audits will also differ from one auditee to another, depending on the auditees' actual orientations on various areas of sustainable energy (for example: energy generation, energy consumption or savings, energy efficiency, environmental protection, research and development). General criteria for sustainable energy may be found from OECD and IEA sources.

For instance, the SAI of Sweden conducted a performance audit called Government actions to handle large scale power failures in compliance with criteria mostly laid down by the SAI itself. Incorporated in these criteria were reasoned requirements to provide for national security at times of crises (see Annex No. 1 – Case studies on audits performed, for details).

The SAI of Canada has laid down as its audit criteria laws, regulations, central requirements and standards developed by recognized professional organizations. The criteria are also discussed with audit entity management. Before the auditing begins, management should agree that the criteria form suitable and reasonable standards against which to assess how well an entity or function is performing.

(see Annex No. 1 – Case studies on audits performed, for details).

What are the most relevant audit questions to ask?

The audit preparation phase should culminate in the elaboration of a detailed audit procedure. This procedure will serve as a manual that can be referred to by the auditors while engaged in the actual performance of the auditing activity. The procedure should be produced bearing in mind all the information gathered during the audit preparation phase. Internal methodology materials available for various areas, or INTOSAI directives and standards can be of assistance in laying down the audit procedure.

The detailed audit procedure entails making a decision about the methods of information gathering and analysis, as exemplified by the model audit logic matrix.

The following audit logic matrix contains an issue analysis for two example areas:

1. Example No. 1 – Increasing the percentage share of RERs in the total final consumption;
2. Example No. 2 – Increasing the energy efficiency and attaining energy savings.

Both examples are developed using a Question Tree. The Question Tree illustrates the actual questions, which are arranged by levels of importance. The general instruction on how to cope with the issue analysis and question tree is in Annex No. 5 – Issue Analysis.

AUDIT LOGIC MATRIX – a performance audit planning instrument

Audit questions	Sources for defining the audit criteria[7]	Criteria	Audit evidence	Methods of gathering and analysing information
Issue Analysis (See Annex No. 5) **Example No. 1*** Increasing the percentage share of RERs in the total final consumption **Example No. 2*** Increasing the energy efficiency and attaining energy savings	**Auditees' commitments and obligations resulting from the competencies of the parliament, government, and other government bodies** (e.g., the European Communities) **Generally binding legislative norms** (international treaties/agreements, Acts, government directives, or decrees) **Standards and norms adopted outside or within the auditee** (other implementing or executive regulations, directives, instructions, or technical standards) **Performance indicators identified at other comparable organizations** **Good practice (well-proven procedures used at other organizations)** **Performance indicators set by the auditor based on his/her professional judgment**	**See Chapters 3 and 4**	**Documentary evidence** (the form of proof – facts as expressed by numbers and descriptions) **Other evidence:** • Expert opinions; • Audiovisual recordings; • Photographs; • Items of analytic proof (mathematical, statistical, etc.). **Sources of evidence (information serving as proof):** • The auditee; • Public administration bodies; • Professional public (published research); • Beneficiaries of subsidies and public support ; • Suppliers; • Stakeholders (a person, group, organization, or system that affects or can be affected by an organization's actions).	**Quantitative evidence-gathering techniques** Studies of documents; research (sociological inquiries, questionnaire surveys – in a written form, over the Internet, over the telephone); other measurements of indicators under scrutiny. **Qualitative evidence-gathering techniques** Interviews (in-depth conversations, focus groups); observation, studies of documents. *Note: The decision regarding the use of a method to collect information is influenced by the need of working with primary or secondary information.* **Quantitative evidence-analyzing techniques** Causal analysis; contingency tables; statistical methods – descriptive statistics; regression analysis; correlation analysis; econometric models; the time series method; systems dynamics (simulation modelling, projections). **Qualitative evidence-analyzing techniques** Content analysis; determining the frequencies of occurrence (of topics, categories). **Studies serving as evidence gathering/analyzing methods** (for instance: objective attainment studies, impact studies, comparative studies, ex ante and ex post studies, and other case studies) **Methods of cost-benefit analysis** CBA (Cost/Benefit Analysis), CMA (Cost/Minimization Analysis), CUA (Cost Utility Analysis) **Other methods** (Balanced scorecard, Benchmarking)

[7] Auditors can find some tips for key indicators on the OECD website www.iaea.org/

*** Question Tree Demonstration, using the examples given in the logic audit matrix:**

1 Is the state energy policy conducive to increasing the percentage share of RERs in the total final energy consumption?

1.1 Have programme objectives been set in compliance with state energy policy priorities?

1.1.1 Are the established sources of financing adequate to the purpose of meeting the objectives of the programmes?

1.1.2 Are there established adequate conditions for attaining the programme's objectives?

1.1.3 Have the terms and conditions of the programmes been defined to a sufficient degree of detail and with sufficient precision to allow successful implementation of the programmes?

1.2 Would the implementation of the programmes fulfil the declared objectives?

1.2.1 Have the programmes' results been monitored sufficiently?

1.2.2 Has an analysis of the programmes' results been performed?

1.2.3 Do the results of the programmes comply with the declared terms and conditions?

1.3 Has the system of state support been adjusted to ensure the maximum possible benefits to be derived from the implemented programmes?

1.3.1 Have any precise estimates of programmes' costs been available?

1.3.2 Are the estimated costs comparable to the actual costs of the programmes?

1.3.3 Has there been a proper monitoring and reporting of costs?

1.3.4 Have the financial revenues deriving from the programmes been greater than the financial costs of the programmes?

1.3.5 Can the level of benefits attained be compared with results achieved in other countries?

1.4 Has there been any disbursement (of public funds) from the state budget in support of science and research focused on the area of RERs?

1.4.1 Have the results of science and research funded from the state budget been used effectively?

1.4.2 Is there a link between the results of such research and their practical applications?

1.4.3 Has an analysis been performed of the payback (rate of return) of any funds invested in these kinds of research?

1.5 Is there any support available for projects geared to advance education and to raise awareness in the area of RERs?

1.5.1 Have the spent funds been subjected to any audits?

1.5.2 Do any surveys exist that would explore the impact and rate of success of such projects?

1.6 Has there been an effective use of tax instruments, price regulation, sales prices, and other potential instruments applicable to the area of RERs?

1.6.1 Has the use of these instruments been introduced so as to cover the area of RERs, and have these instruments been supported and implemented by the state?

1.6.2 Have there been any success rate analyses that would explore the use of these instruments for raising the percentage share of RERs?

1.7 Has there been sufficient coordination in this area among the ministries concerned?

1.7.1 Have the ministerial competencies been laid down by legislation?

1.7.2 Do the competencies of the relevant ministries sufficiently cover the area under scrutiny?

1.8 In the cases where the state (government) has accepted a commitment to raise the percentage share of RERs (e.g., by an international agreement or a similar agreement), has this commitment been fulfilled, or to what degree has it been met?

1.8.1 Have any specific indicators been set out?

1.8.2 Have the aforementioned commitments been subject to ongoing monitoring?

1.8.3 Have these commitments been attained?

1.8.4 If not, have any measures been adopted?

2 Have the declared targets of energy efficiency and energy savings been attained?

2.1 Was the adjustment of the programmes commensurate with the required targets?

2.1.1 Has a target been defined for each of the relevant areas of energy savings?

2.1.2 Have any parameters for the programmes been defined?

2.1.3 Is the target set for energy savings measurable?

2.1.4 Have the subsidy eligibility terms and conditions been defined precisely and clearly?

2.2 Has the spending of funds earmarked for support of the beneficiaries of subsidies been effective?

2.2.1 Prior to awarding the subsidy, has an estimate been made of the effect (benefit) of the subsidy if disbursed?

2.2.2 Can this effect be expressed in money terms?

2.2.3 Have the desired indicators been actually attained by the implementing subject?

2.2.4 Has a comparison been drawn with the results of analogous programmes?

2.3 Have the control mechanisms of the programme been properly set as to attain the maximum benefit of the programme?

2.3.1 Have any audits been conducted to determine whether the subsidy terms and conditions were complied with?

2.3.2 Have the declared terms and conditions been adhered to in all cases?

2.3.3 Have the reasons underlying any non-observance to the subsidy terms and conditions been scrutinized?

Note: Example No. 1 can be used in cases where there is a state energy policy; Example No. 2 refers to cases where no such policy exists. The next level of questions depends on the SAI's decision and on the concrete topic of the audit (for more details and for the formulation of further questions, consult Annex No. 5 – Issue Analysis).

Chapter 5:
Audit execution and reporting

The aim of the audit execution phase is to perform an audit conforming to the approved scope, objectives, and approved audit procedure. The procedure of an audit performance conducted in this field can also draw upon the INTOSAI Auditing Guidelines, e.g. ISSAI 5130 Sustainable development: The Role of Supreme Audit Institutions.[8]

Execution of an audit*

Key areas:

- verifying the existence of the objectives, and setting the objectives, of the national energy policy (of programmes, projects, actions); and determining the methods by which they are to be attained (coordination of the formulation and execution of tasks within the framework of the energy policy);
- verifying the existence, completeness, and veracity of preliminary analyses of the area under scrutiny;
- verifying the system of management and auditing of energy policy implementation (programmes, projects, actions);
- checking on the operability of the system employed in assessments of the implementation of policies (programmes, projects, actions); and
- at the beneficiaries of subsidies, verifying adherence to the rules, terms, and conditions of various policies or programmes; verifying the fulfilment of pre-set indicators.

* This is merely an illustrative listing of key areas; a more detailed elaboration of the areas to be audited will depend on the conditions prevailing in the given state. These four key areas are concerned with audits undertaken at responsible institutions/bodies. A fifth key area is concerned with the beneficiaries of support.

5.1 VERIFYING THE EXISTENCE OF DEFINED OBJECTIVES OF ENERGY POLICIES (PROGRAMMES, PROJECTS, ACTIONS) AND SETTING THE WAYS TO ATTAIN THESE OBJECTIVES

The SAI should review especially whether:

- the government has decided to have a national energy policy formulated (for instance, in linkage to international Acts or pursuant to an independent decision of the given state);
- a national energy policy has been formulated and its objectives defined;
- the national energy policy specifies the managerial instruments to be applied to the field of sustainable energy;
- the energy policy defines priorities in the field of sustainable energy (for example, wind energy, biomass, energy savings);
- the national energy policy addresses the provision of funding required for its implementation;
- the fulfilment of the national energy policy objectives is being coordinated by responsible bodies, and responsibilities as well as deadlines for its specific tasks have been defined and assigned; and
- the national energy policy has been developed to the level of programmes.

For instance, the SAI of Australia recommended that the annual reports of the agency incorporate a statement about whether all the energy policy requirements had been met and also whether appropriate measures had been adopted to cope with any findings identified. Following this recommendation, the government decided to update its energy policy.

The SAI of the Czech Republic found out that the state was to produce an energy policy that would set the priorities for exploiting the different types of RERs and would result in a targeted orientation of the distribution of support.

[8] http://www.issai.org/

The SAI of Morocco recommended that a national vision be elaborated that would cover the field of RERs and would define new strategies taking into account the recommendations formulated by the SAI.

The SAI of Canada recommended that clearly defined and concrete objectives be set in the area of greenhouse gases mitigation for each of the programmes produced for this purpose (see INTOSAI WGEA publication Auditing Government Response to Climate Change on the website www.environmental-auditing.org).

The SAI of the Czech Republic determined that the programmes supported by the state had been those whose contributions to increasing the volume of energy generated from RERs or to energy savings had been small or negligible.

The SAE of Estonia found out that the state failed to allocate to any organization the responsibility for integrating the requirements for reaching the desired energy efficiency.

Details on the aforementioned cases can be found in Annex No. 1 - Case studies on audits performed.

5.2 VERIFYING THE EXISTENCE, COMPLETENESS, AND VERACITY OF PRELIMINARY ANALYSES OF THE AUDITED AREA

The SAI should verify especially whether:

- the auditee has set the objectives in the area of sustainable energy based on an analysis of the start-of-project situation, identification of the requirements for sustainable development/energy, and an analysis of the strengths, weaknesses, opportunities, and threats (SWOT analysis);
- the auditee has taken optional solutions into account; has specified appropriate policy implementation instruments; has chosen these instruments in an unbiased manner; and
- the requirements for attaining the pre-set objectives relating to the area of sustainable energy were set completely, unambiguously, correctly, and feasibly.

For instance, the key objective set out in the Czech Republic's national energy policy was to reach a percentage share of 8 % of electricity generation from RERs on its gross consumption by 2010. The audit resulted in the finding that this declared parameter appeared not to be reached in 2010. The relevant responsible bodies when audited failed to present any proposal for a conceptual solution based on this finding. It was also ascertained that although there had been analyses available pointing to the fact that under the Czech conditions the greatest development potential was that of generating energy from biomass grown specifically for that purpose, the support toward the application of RERs had been distributed broadly. Even the regulation of the sales price of electricity generated from RERs guaranteed profitability for all kinds of RERs.

The SAI of Australia when conducting its audits found that the target percentage share of total energy generation from RERs reached by 2010 would be 6 %.

For details concerning the above examples, consult Annex No. 1 - Case studies on audits performed.

5.3 VERIFYING THE SYSTEM OF MANAGEMENT AND CONTROL OF THE PROGRESS OF IMPLEMENTATION OF THE NATIONAL ENERGY POLICY (PROGRAMMES, PROJECTS, ACTIONS), AND ASSESSMENT OF THE INTERNAL CONTROL SYSTEM

The SAI should especially verify whether:

- the given action or project is in compliance with the defined policy or programmes, and is oriented to meet the terms and conditions for inclusion on the programme under scrutiny;
- a cohesive and transparent procedure has been defined for the selection of projects and actions;
- the terms and conditions of using the instruments of the state energy policy have been laid down; the observance of such terms and conditions is mandatory for the support beneficiaries; the conditions for extending the support include any penalties for non-adherence to the said terms and conditions;
- the body responsible for the distribution of support has complied with applicable legislation, regulations, and terms;
- the obligations of the bodies responsible for the administration of the different programmes have been laid down (these follow from the legally binding terms of the programmes called; adherence to the terms and obligations arising therefrom for the providers of support can also be anchored in the agreement/contract concluded between the support provider and the beneficiary);
- the method of determining the amount of support and the way of spending has been defined;
- the method of the projects evaluation has been defined; and
- the existence and effectiveness of auditing the use of the instruments applicable to the management of the state energy policy has been provided for.

5.4 CHECKING ON THE OPERABILITY OF THE SYSTEM EMPLOYED IN ASSESSMENTS OF THE IMPLEMENTATION OF POLICIES (PROGRAMMES, PROJECTS, ACTIONS)

The SAI should answer the following questions, e.g.:

- Have any indicators been set out by the responsible body for monitoring and assessing the economy, effectiveness, and efficiency of the results reached in the system of subsidy providing?
- Were these indicators commensurate with the key objectives of the given policy (programme, project, action)?
- Have the indicators been set out by the responsible body so as to express the degree of progress in relation to the objectives?
- Are the costs as well as e.g., the outputs, deliverables, and impacts of the activities, measures, and programmes involved being monitored and evaluated by the responsible body?
- Have the sub-indicators been set in such way as to allow their summarization for the purpose of the global objective assessment?
- Are the indicators clearly defined (SMART) and described?
- Have correct and clear explanations of the indicators been given in relevant documentation?
- Have any evaluations of the programmes/projects/measures been conducted by the responsible body or as the case may be, by the beneficiary of support in compliance with approved documentation?
- Have any measures been adopted by the responsible body or as the case may be, by the beneficiary of support toward removing the shortcomings (if any) based on the evaluations of the programmes/projects/measures?
- Has the responsible body been conducting ongoing checks of the progress of project implementation, and has it produced an evaluation of the completed project?

For instance, the SAI of the Czech Republic found out that extending support to resources requiring the greatest investment demands had resulted in a significant increase of the price of electricity to end customers (this applied mainly to photovoltaic systems).

In the area of sustainable energy, quantifiable indicators can be used, such as

- growth of electricity and heat generation from RERs;
- raising the installed thermal output from RERs;
- raising the installed electric power output from RERs;
- mitigation of the emissions of greenhouse gases and of pollutants into the atmosphere because of the use of RERs, or because of a more effective utilization of non-renewable energy resources;
- reduced technical losses in distribution networks; and
- reduced energy consumption.

For instance, the Czech SAI found that the sub-indicators of certain support instruments had been set out in quantities different from those used for defining the global objective. The numeric value of a sub-indicator in one of the programmes had been set equal to the value for the global objective whose attainment however had been co-determined by other instruments as well. In the case of certain support indicators, the monitored indicators had been specified but numeric target values were missing.

5.5 AUDITS AT BENEFICIARIES OF SUPPORT

Audits at beneficiaries of support are focused on the implementation of projects or actions. The SAI may audit, for instance, the following

- Have all the conditions for acceptance of a project or action for implementation been fulfilled by the beneficiary of support?
- Was the beneficiary of support under any obligation to adhere to pre-set terms, conditions, indicators and parameters as determined by the responsible body?
- Have all the terms, conditions, and parameters applicable to project implementation been adhered to by the beneficiary of support?
- Has all legislation applicable to public procurement been complied with by the beneficiary of support while implementing the project/action?
- Has the beneficiary of support proceeded in compliance with legislation and regulations applicable to taxation and accounting?
- Has an assessment of the implemented project been produced by the beneficiary, and has the full amount of the subsidy been accounted for in the beneficiary's accounting?

5.6 ELABORATION OF AN AUDIT REPORT SETTING OUT THE OUTCOME OF THE AUDIT

The objective is to present an assessment of the facts that have been found, to summarize any findings identified, to point out the most serious problems faced in the audited area of sustainable energy, and to make recommendations of remedial measures as necessary.

Elaboration of a report on the outcome of the audit

Key areas:

- assessment of the audit;
- description and summarization of the findings identified, highlighting any system failures or inadequate legislative norms in the field of sustainable energy that has been subjected to the audit;
- quantification of the findings identified; and
- formulation of generally valid conclusions and recommendation of potential remedial measures (depending on the given SAI's mandate).

The report on the outcome of the audit can be submitted for consideration by a variety of agencies and individuals, including: the government, parliaments, president of the country or other relevant state administration bodies, and the public (depending on the conditions under which the given SAI operates).

Elaboration of the audit report can draw on the experience of other SAIs or even on the standard ISSAI 400 – INTOSAI Auditing Standards – Reporting Standards (Reporting Standards in Government Auditing) (www.issai.org).

5.7 IMPACT EVALUATION AND MONITORING

It is the SAI's decision whether, after completion of an audit focused on the area of sustainable energy, ongoing monitoring activities and evaluations of subsequent progress in the field that has been audited will continue.

Impact evaluation and monitoring

Key areas:

- following up the remedial measures if any adopted as a result of the audit as well as the ways in which these measures have been implemented;
- monitoring impact assessments;
- following up the trends of spending from the state budget in the field of RERs, energy savings, and so forth; and
- monitoring of significant changes to the energy instruments (programmes, policies, strategies, etc.).

As long as the given SAI has the appropriate authorization, it can follow up on how recommendations based on the audit are being implemented. It can also follow up the trends manifested in the area under scrutiny, developments of important indicators, and other such matters.

Such monitoring will also help to determine whether this area is or will be audited by some other government institution, or whether the audits focused on the given topic are also conducted in other countries, and with what results.

This monitoring may result in repeating the audit in an area already audited, or in presenting topics well-suited for further potential audits.

Annex 1:
Case studies on audits performed

The following case studies are based on the work of SAIs from around the world. Case studies were chosen in order to cover the variety of topics focused on the area of sustainable energy.

Energy Efficiency in Commonwealth Operations – Follow up Audit

Country and year of publication	Australia, 2003
Type of audit	Performance
Audit form	Individual
Audit objective	The objectives of the audit were to assess the extent to which selected Commonwealth agencies have implemented the recommendations of Report No. 47 of 1998-99, taking account of any changed circumstances or new administrative issues identified as impacting upon implementation of these recommendations and to offer continued assurance to the Parliament on the management of Commonwealth agencies' compliance with the Commonwealth energy efficiency requirements, and to identify areas for better practice in energy management by those agencies.
Audit scope	The Audit "Energy Efficiency in Commonwealth Operations – Follow-up Audit" conducted over 2002/2003 was executed to determine if the Government Departments had implemented the 7 recommendations, assure Parliament of compliance with Commonwealth energy efficiency requirements and to identify areas for better practice.
Audit criteria	• The Energy Policy Objectives outlined in the 1998/99 Audit. • The 2001/02 Whole of Government Energy Use Report.
Methods used	The methodology comprised a questionnaire to 10 agencies, analysis of their responses, follow-up interviews and review of relevant agencies and documents.
Findings	• Overall, agencies involved in this follow up audit have made satisfactory progress in implementing the recommendations of Audit Report No. 47 of 1998-99. • The two co-ordinating agencies have effectively implemented the recommendations relating to their policy co-ordination and leadership functions.
Recommendations	SAI recommended that an agency's annual energy efficiency report to its portfolio Minister include an indication of whether all the requirements of the Energy Policy were complied with and, where this did not occur, an indication of the areas of non-compliance, and either the steps being taken to remedy the situation, the barriers to implementation, or a statement that specified requirements are not considered to be relevant to the agency.
Impacts	Since the audit was tabled in 2003, the Government has updated the energy policy with revised targets for tenant light and power and office central services.

Renewable Energy: Knowing What We Are Getting

Country and year of publication	Australia, 2007
Type of audit	Performance
Audit form	Individual
Audit objective	The audit focused on whether Australians can be confident that when they buy renewable energy from Synergy and Horizon Power it is from a renewable source and is properly accounted for. It also examines: • whether the GreenPower programme is increasing the supply of renewable energy in Western Australia; and • the basis of the State Government's renewable energy targets and whether they are measurable, auditable, and reliable.
Audit scope	• Government businesses that buy and sell renewable energy (Synergy, Horizon Power). • Government stakeholders with an interest in the generation and distribution of electricity in Western Australia.
Audit criteria	The criteria were set in renewable energy programmes and other relevant documents.
Methods used	• researching relevant documents and legislation; • examining key documents; • interviewing the staff.
Findings	• The public can have confidence that certified renewable energy, that is energy that is certified with Renewable Energy Certificates through the Mandatory Renewable Energy Target and GreenPower programmes, comes from renewable sources; • Since 2001-2002, electricity generated by accredited renewable energy sources on the South West Grid has increased from 1% of total energy generated to five per cent at June 2007. The mandatory target and GreenPower programmes have contributed to this increase; • The Western Australian Government is on track to meet its target for 6% of all energy on the South West Grid to be from renewable sources by 2010. The 2020 target for 15% of all energy on the South West Grid to be from renewable sources would also be met if new renewable energy generating plants under construction or on the drawing board proceed.
Recommendations	Government agencies should ensure that they: • educate consumers about renewable energy; • are transparent about what people are paying for; and • report regularly against their renewable energy targets.

Electrical Losses Audit

Country and year of publication	Brazil, 2008
Type of audit	Performance
Audit form	Individual
Audit objective	The purpose of this performance audit was to evaluate the impact of the losses in Brazilian electrical system. The electrical losses are divided into technical and commercial losses. Technical losses are caused by dissipation of energy on the drivers, which is inherent to the physical characteristics of the installations, and is also related to the maintenance and quality of the equipment. The commercial losses are caused by fraud, theft, and lack of measurement. The audit covered the years from 2003 to 2007.
Audit scope	National Agency of Electrical Energy.
Audit criteria	The criteria are the standards or indicators used to determine whether the programme, activity, project, or auditee achieved or exceeded the expected performance. The assessment of whether or not the criteria were met results in an audit observation and in audit findings.
Methods used	• expert opinion; • risk analysis; • physical documents; • interviews and questionnaires; • activity report of auditee and annual reports; • statistical data.
Findings	• The level of losses in the electrical system is a determinant factor for the tariff level as well as for establishing the need for investment in new enterprises of generation, because, for a given demand, the larger the losses the more energy would be generated and injected into the system. Thus, a part will be consumed, billed and paid effectively, and another part will be dissipated in the drivers, stolen, not measured or not paid. A certain level of losses is unavoidable, but certainly is manageable and subject to regulation. Appropriate incentives must be offered to all the agents of the system to enable better energy efficiency, otherwise negative external economic and environmental factors will be felt throughout society. • The actions performed by the Agency to reduce the electrical losses were not effectively implemented. • The concessionaires were inefficient in combating the electrical losses, which is not in compliance with law.
Recommendations	The main recommendation to National Agency of Electrical Energy was that it put into practice its rules that had not been implemented.
Impacts	To estimate the magnitude of the commercial losses caused by fraud and theft, which was about 19 TWh in 2007, this amount is equivalent to the entire market of the State of Minas Gerais with their 6.2 million consumers during one whole year. On the other hand, the 25 TWh of technical losses are sufficient to supply for one year the States of Bahia, Pernambuco, and Ceará. These States provide energy to 1.6 million consumers.

Environmental and Energy Audit

Country and year of publication	Brazil, 2008
Type of audit	Performance
Audit form	Individual
Audit objective	The results of the new energy auctions in 2005 and 2006 to evaluate how the restriction on supply of electric energy (because of lack of environmental license): • affects the configuration of the planned matrix of the country; • increases the risks of no-supply; and • increases the price level of the supplied energy.
Audit scope	• Ministry of Mines; • National Agency of Electrical Energy • Ministry of Environment; • Energy Research Enterprise; • Brazilian Institute of Environment and Renewable Natural Resources.
Audit criteria	The criteria are the standards or indicators used to determine whether the programme, activity, project, or auditee achieved or exceeded the expected performance. The assessment of whether or not the criteria were met, results in an audit observation and in audit findings.
Methods used	• expert opinion; • risk analysis; • physical documents; • interviews and questionnaires; • activity report of auditees and annual reports; • statistical data.
Findings	• Preserving the security of the system and ensuring low prices should be the basic principles of the planning and implementation of the expansion of the Brazilian electrical matrix. • There is still a need to improve the processes related to the implementation of the Brazilian electrical matrix as stipulated by the Decennial Plan of Electrical Energy Expansion and by the other public policies related to this area, with emphasis on the National Policy of Environment.
Recommendations	• Objectively establish criteria for defining environmental compensation, with maximum limit allowed and gradation of the percentage equivalent to the environmental damage foreseen; • Carry out feasibility studies for hydroelectric use; • Improve the implementation of the Brazilian electrical matrix, aiming, above all, to meet the purposes of the Decennial Plan of Electrical Energy Expansion.

Reducing Greenhouse Gases Emitted During Energy Production and Consumption

Country and year of publication

Canada, 2006

Type of audit

Performance

Audit form

Individual

Audit objective

- Determine, through the examination of selected federal government programmes intended to reduce the quantity of greenhouse gases emitted during the production and consumption of energy in Canada, whether the federal government can demonstrate that these programmes achieved expected results.
- Determine whether the federal government can demonstrate that programmes intended to reduce the quantity of greenhouse gases emitted during the production and consumption of energy are contributing, as expected, to the achievement of its broader short-term commitments and long-term goals for greenhouse gas emission reductions.

Audit scope

The examination covered a number of programmes and initiatives funded and implemented through Natural Resources Canada from 2000 to March 2006. Under Objective 1, the Wind Power Production Incentive, the EnerGuide for Existing Houses programme, and the Ethanol Expansion Programme were examined, each of which was allocated funding of $100 million or more. Before the end of our audit work, the EnerGuide for Existing Houses programme was discontinued.

Under Objective 2, the following programmes were examined: programmes intended to reduce greenhouse gas emissions associated with the oil and gas sector, to advance wind power as a renewable source of electricity, and to enhance energy efficiency in homes in Canada.

Audit criteria

Under Objective 1, SAI Canada on two audit criteria drawn primarily from various federal government sources: one criterion related to results and the other related to financial management. In the first case, SAI Canada expected Natural Resources Canada to have fair and reliable information on the results achieved by the programmes for which it is responsible.

With respect to finances, SAI Canada expected the Department to have fair and reliable information on all appropriations and expenditures associated with the administration and implementation of the programmes for which it is responsible.

Under Objective 2, SAI Canada expected that, where the federal government has made associations among programmes, Natural Resources Canada has fair and reliable information on how these programmes contribute to the achievement of the government's larger goals for greenhouse gas emission reductions.

Methods used

In carrying out the audit, government officials from Natural Resources Canada, Environment Canada, and a number of other departments were interviewed; and programme files, reports, financial statements, and other documents were reviewed. As well, the auditors interviewed selected recipients of government funding under the programmes audited, provincial government officials who were responsible for similar programmes, other key stakeholders, and officials of countries considered leaders in the areas of wind power, energy efficiency, and energy policy.

Findings

Natural Resources Canada is accountable for achieving greenhouse gas emission reductions from the Wind Power Production Incentive, EnerGuide for Existing Houses (until it is wound down), and the Ethanol Expansion Programme. Though these programmes are only a sample of those under the Department's responsibility, they represented more than $800 million in authorized funding. Natural Resources Canada's performance expectations for emission reductions from these programmes were confusing. While the Department achieves results, it does not consistently report publicly on programme performance against emission reduction and other targets. This hinders Parliament's and Canadians' ability to hold the Department accountable for climate change results.

Natural Resources Canada monitors and reports on funding and expenditures for the programmes that SAI Canada examined in detail. However, the financial systems and processes are overly complicated; making it difficult to track and report authorized funding and spending at the programme level.

Oil and gas production, particularly the rapid development of Canadian oil sands, is significantly increasing greenhouse gas emissions. However, federal initiatives aimed at this sector have achieved minimal reductions to date and have not yet contributed as expected to federal climate change objectives. The federal government, under the leadership of Natural Resources Canada and in co-operation with the provinces and territories, is not clear on how it intends the country to balance the need to reduce these greenhouse gas emissions with the growth expected to take place in the oil and gas sector.

Recommendations

The following recommendations were given:

- Natural Resources Canada should lead the development of a wind power strategy for Canada, in collaboration with the provinces and wind industry. The strategy should provide a vision for wind power in Canada and identify what governments will do to support it, and over what timeframe.
- Natural Resources Canada should complete the evaluation of the Wind Power Production Incentive that it committed to in 2002. It should also complete a thorough economic analysis to clarify the extent to which the economics of wind power are changing across Canada and whether there are implications for this programme.
- Natural Resources Canada, on behalf of the Government of Canada, should make clear to Parliament by the end of 2006 how and to what degree the country will reduce greenhouse gas emissions in the oil and gas sector, both in the immediate and longer term. At the same time, Natural Resources Canada should develop a corresponding implementation plan.
- Natural Resources Canada should ensure that clear and concrete greenhouse gas reduction targets are established for each of its programmes funded for this purpose. The Department should provide clear and detailed information to Parliament about the performance of its programmes compared with greenhouse gas emission targets, and the costs incurred.
- Natural Resources Canada should establish consistent practices for financial management and reporting of authorized funding and spending at the programme level.

Audit investigation on bio-energy (gasification of crop stalks) collective supply project

Country and year of publication	China, 2008
Type of audit	Performance
Audit form	Individual
Audit objective	Through audit investigation on the construction process, the raising, managing and using of funds for bio-energy (gasification of crop stalks) collective supply project in A City, and through the analysis of the economic and social benefits of the project, the economy, efficiency and effectiveness of the project will be assessed, the project's roles on energy conservation, pollution reduction and environmental protection will be evaluated, and problems emerging from the construction and operation of the project will be exposed. Auditors will, accordingly, analyze the causes of those problems and put forward corresponding recommendations, and provide the government with some fundamental and actual material regarding sustainable energy promotion in rural areas of China.
Audit scope	Financing status: reviewing of the financing status of every collective stalk gasification supply project, and to reveal problems emerging from the financing process. Investment and construction status: to check the investment and construction status of the project, including the investment in equipment, construction, and installation, the administrative fee during construction, and other expenditures; and to verify problems emerging during project implementation process. Production cost and performances analysis: to verify the cost of the project, including raw materials (crop stalks) used and related expenditures that have occurred; to evaluate the benefits of the project, including the volume of methane and its by products generated by a project, as well as the number of households and population that a project's gas output could supply. Social benefits analysis: to assess the number of households benefited by the project and the volume of crop stalks consumed annually by the project, through a set of scientific statistical criteria to convert methane energy generated into weight of standardized coal conserved; to survey and analyze the price of methane generated by crop stalks, compare it with the price of liquid petrol gas (LPG), and calculate the money saved annually due to the using of methane for cooking in rural areas; and to evaluated the roles that the project played after implementation in reducing pollutant (including SO_2, CO_2) emission and solid wastes (oven cinders) generation.
Audit criteria	• Audit Law of the People's Republic of China; • Renewable Energy Law of the People's Republic of China; • Environmental Protection Law of the People's Republic of China; • Atmosphere Pollution Prevention Law of the People's Republic of China; • The State Council's Regulations on Banning Crop Stalks Burning and Promoting Comprehensive Utilization of Crop Stalks; • Thermal Units, Symbols and Their Conversion (GB/T2586-1991), etc.
Methods used	• document review; • on-site Observation/ Field Check; • inquiry; • analytical review, and other such criteria.
Findings	The audit finds that the crop stalks gasification and collective supply project improves the living standards and quality of farmers, reduced the rural environmental pollution caused by crop stalks random storage and open field burning. The project produced clean energy through bio-energy conversion, saved limited energy, like coal, and promoted sustainable use of energy, which play active roles in building a resources-conserving and sustainable society. In relation to economic benefits, the audit investigation found that the first phase of collective gas supply project of A village, A city had a loss of 2868.2 RMB Yuan due to the low gas price and consumption volume. The auditor assessed that it needs at least 105 household users to make both ends of the gasification project

meet. If all 400 households of the village use methane, a 30,000 RMB Yuan profit will be made annually. In relation to social benefits, the audit investigation identified that the project can: firstly, conserve energy (the project consumes 300 tons of crop stalks annually, which may conserve about 150 tons of standardized coal); secondly, reduce daily expenditure for rural households (as measured and calculated, gasified stalk methane only costs a common household of three persons 30 RMB Yuan (4.4 USD) per month, which is 40 RMB Yuan (5.9 USD) lower than that of LPG); thirdly, protect the environment (after the implementation of the project, emission of pollutants like CO2 and SO2 and generation of solid wastes are remarkably reduced, the pollution caused by fossil energy consumption is alleviated and atmosphere quality deterioration caused by crop stalk burning is effectively prevented). However, audit investigation identified some problems in the project. Firstly, due to inadequate recognition of crop stalk gasification techniques, farmers showed limited interest in using crop stalk methane. Secondly, the investment for construction of crop stalk gas collective supply stations is not sufficient. The subsidies from provincial and municipal government are comparatively low, some counties and towns could not provide counterpart investment due to constrained public finance. Thirdly, the applied techniques for crop stalk gasification need to be further developed and improved.

Recommendations

- The government shall improve its planning on crop stalk gasification and collective supply stations. The construction plan must be considered together with the strategic planning of rural development, so as to enlarge the scale of collective inhabitation and increase the stalk methane supply to an economic operation scale which will reduce the cost of methane production.
- The government shall invest more public funds in the project to help the construction of gas stations and increase subsidy level. Meanwhile, the government shall encourage private sector investment in this area to promote the development of renewable energy on a larger scale.
- The government shall organize related institutions and entities to carry out collaborative technical research in this area, in order to improve the techniques of gasification and standardization of equipment. Research institutions and equipment manufacturers shall collaborate and improve the technical performance of equipment through technical introduction and self-research and development.
- The government shall strengthen the project's safety management to ensure safe operation of the project. Firstly, safety monitoring and management systems for crop stalk gasification and collective supply stations should be established and strictly complied with. Routine check-ups should be conducted in gasification stations. Secondly, a workers' training plan and working certification system should be established to regulate the operation of gasification stations to ensure safety production. Thirdly, specifications for using gas should be prepared and introduced to all households, in order to ensure the safe use of gas.

Financial means allotted to support programmes for energy production from renewable energy resources

Country and year of publication	Czech Republic, 2009
Type of audit	Compliance
Audit form	Individual
Audit objective	Review the spending of funds earmarked for support of the use of renewable energy resources; this includes setting up the conditions conducive to meeting the indicative goal of reaching a share of 8% of electricity generated from RERs in the total gross consumption of electric power in the Czech Republic by 2010.
Audit scope	• Ministry of Industry and Trade of the Czech Republic; • Ministry of the Environment of the Czech Republic; • State Environmental Fund of the Czech Republic; • CzechInvest, the Investment and Business Development Agency; • selected beneficiaries of financial assistance.
Audit criteria	Pertinent legislation including the State programme in support of energy savings and the use of RERs.
Methods used	During the audit the following methods were used: • analysis of physical documents; • interviews; and • analysis of statistical data.
Findings	• The indicative objective of 8% share of energy generation from renewable sources on gross domestic electricity consumption in 2010 was not approachable. This finding was also mentioned in the previous audit. However, responsible subjects have not submitted any proposal on conceptual solutions conducive to real indicator determination. • The audited programme contributes only in a little or an insignificant manner to the increase of volume of energy production from renewable resources or to energy savings. • Existing analyses reveal that biomass has the biggest potential in the Czech Republic (first of all, plants grown for this purpose). Despite this fact, the support for RERs is being applied to all kinds of RERs equally. • The price regulation guarantees profitability of all kinds of renewable energy resources. • When the support is provided for resources that require highest investments (such as photovoltaic systems), the price of electricity for final consumers is increased significantly. • The state policy aiming at setting priorities for using RERs and at targeted funding is missing.

State actions for obtaining efficiency of energy end-use

Country and year of publication	Estonia, 2009
Type of audit	Performance
Audit form	Individual
Audit objective	The first objective is to assess whether the state has implemented appropriate means to achieve necessary efficiency of energy end-use. The second objective is to assess whether the public sector has taken the exemplary role and implemented appropriate energy efficiency improvement measures.
Audit scope	• Ministry of Finance, Ministry of Economic Affairs and Communications, Riigi Kinnisvara AS (State property joint-stock company); • The audited period was 2006–2008; • State actions toward energy end-use efficiency; state actions towards energy end-use efficiency in the public sector.
Audit criteria	The National Energy Efficiency Action Plan's (NEEAP) measures ensure energy savings target of 9% for the year 2016. The public sector fulfils an exemplary role in the context of energy end-use efficiency. The source of criteria was: Directive 2006/32/EC on energy end-use efficiency and energy services.
Methods used	• benchmarking; • decision analysis; • performance analysis; • legal analysis (public procurement legislation); • performance assessment (good practices in Finland and Austria).
Findings	• The aims and expected results will not be achieved with the NEEAP. • The public sector has not been implementing energy efficiency improvement measures and does not fulfil an exemplary role. Estonia has not assigned responsibility for the integration of energy efficiency improvement requirements to any organisation.
Recommendations	• to amend the NEEAP with appropriate and measurable measures; • to build up an information-collecting, analysing and publishing system; • to assign an organisation responsible for energy efficiency in public sector; • to implement appropriate measures on public procurement process.

Audit on the system of electricity supply

Country and year of publication	Hungary, 2007
Type of audit	Performance
Audit form	Individual
Audit objective	The audit objective was to assess whether a smooth operation of the electric energy production and provision activities at a reasonable price level was adequately ensured by the operational arrangements of, and changes to the electricity supply system, the public governance, the division of governmental tasks and the ownership arrangements for production and provision activities.
Audit scope	• Ministry of Economy and Transport, Ministry of Environment, the Prime Minister's Office, Ministry of Finance, MAVIR Hungarian Transmission System Operator Company, Ltd., Hungarian Energy Office, Hungarian State Holding Company and Vértesi Power Company Ltd. • The audited period was the period of 2003 to 2007, the prior and following periods were taken into account where relevant. • The audit covered the management, the structure, the regulation and the system of methods of the supervision; the evaluation of the strategic validity of the electric energy system, of its resources, environmental background as well as the evaluation of the operation, its technological background and security together with the relevant pricing policy and price regulation.
Audit criteria	The criteria set in the government decree of the Act on Electric Energy and the execution of the act, in EU directives, professional explanations and methodologies, furthermore in rentability calculations and in regulations concerning privatization. The sources of criteria were: • rules set by law, regulations, or the government; • indicators and parameters set by government; • international conventions; and • price data. Sources of renewable energy (e.g., biomass and wind energy) help hydrocarbons, and their utilisation is receiving more and more attention. At the moment of its accession to the EU, Hungary made only a minor pledge in this respect; namely to increase by 2010 the share of biomass-based energy to 3.6% in the total produced electric energy. A 5.9% rate had already been achieved in 2005. Utilisation of wind power energy was promoted by a 2005 amendment to the Act on Electric Energy, which set a high, compulsory price for purchasing such energy. However, the ability to regulate the wind power plants is restricted due to their dependence on the weather conditions, therefore the Hungarian Energy Office set a 330 MW cap on the production capacity of an individual wind power plant.
Methods used	Legal analysis (analysis of legal environment), risk analysis, benchmarking (international), economic analysis, statistical analysis, and performance assessment.
Findings	• The engineering and economic toolkits of electricity supply system have drawbacks, which badly affected the operation of the two-level market model and the extent to which the market liberalisation was prepared. • It is a plus that the utilization of renewable energy resources and, within this category, that of the biomass and wind energy, have increased. On the other hand, it is negative that from 2005 onward there was less assurance that the changing loads and malfunctions were regulated. • Because of the expected decrease in capacities, the aging of the appliances, and the need to ensure reserves, there is a requirement to build additional capacities. • Because of the exposed market, it is necessary to provide for socially needy consumers.

Recommendations

- It was recommended that the Government and the Minister of Economy and Transport treat with special attention the national analyses and European experiences, in the interest of optimising long-term impacts, when developing decrees on how to implement the Act on Electric Energy.
- In addition, the SAO stressed that re-negotiation on LTEPAs (long-term electricity purchase agreements) should result in business decisions that comply with EU rules, do not place a burden on the Hungarian budget, and also take into account consumers' interests.

Impacts

- As a consequence of the audit recommendations on 1 January 2008 the Government promulgated 5 government decrees and 7 ministerial decrees in order to be able to transform the domestic electric energy market in harmony with the EU regulations.
- Following the recommendations addressed to the minister, he had an action plan prepared in which he reported, that the public organizations dealing with electric energy will observe the findings and recommendations in the course of their future operation.

Performance audit of the Centre Renewable Energy Development

Country and year of publication	Morocco, 2006
Type of audit	Performance
Audit form	Individual
Audit objective	Main objective was to make a general diagnosis of the Centre of Renewable Energy Development (CDER) in order to formulate suggestions and recommendations in order to improve the management and to increase the efficiency of the centre to support energy savings and use of RERs.
Audit scope	• Bodies of direction; • Legal mission; • Financial organization; • Information system; • The audited period was the years from 2000 to 2005, the prior periods were taken into account where relevant.
Audit criteria	• law; • regulations; • standards and indicators; • international benchmarking.
Methods used	• legal analysis (analysis of legal environment); • risk analysis; • performance.
Findings	Even if the renewable energy sector becomes very dynamic and offers numerous opportunities for investment, Morocco has not taken enough advantage of the development of this field. The analysis of the centre since its creation shows that the results remain very limited. Concerning research, adaptation, and diffusion of renewable energy techniques to the Moroccan context, the Centre of Renewable Energy Development's actions remained very limited.
Recommendations	The Court of Account of the Kingdom of Morocco recommended: • a national vision concerning renewable energies; • focusing the activities of the CRED around its legal mission (that is, establishment and execution of programmes of studies and scientific and technical research); • establishing a clear strategy, objectives, and a work plan for the CRED; and • improving investment in the renewable energy development.
Impacts	Definition of a new strategy taking account of recommendations formulated by the Court of Accounts.

Government actions to handle large-scale power failures

Country and year of publication	Sweden, 2007
Type of audit	Performance
Audit form	Individual
Audit objective	The objectives were to audit whether government and the responsible agencies have sufficient basis for action plans to prevent large-scale power failure. The audit also scrutinized whether government preparations gave the necessary requirements to handle a power failure on a national scale, should such a crisis occur.
Audit scope	• Ministry of Enterprise, Energy and Communications, the national agency "Svenska Kraftnät", and the Swedish power industry; • The audited period was 1998 to 2007, the first five years relating to international threats to power supply; • Action plans to prevent large-scale power failures, as well as the necessary requirements to handle a power failure on a national scale, should such a crisis occur.
Audit criteria	The criteria set in the National programme – crises preparedness decree as well as the electric power Act that regulates demands for preparedness in agencies and power industry. This audit was carried out with criteria that to a large extent were set by the Swedish national audit office and covered reasonable demands for national crisis security, such as: • objectives and demands set as well as distribution of responsibility should give prerequisites for preparedness to handle crisis; • good preparation should be made to provide robust power supply systems; • risk analysis should cover the risks to power supply and be the basis for action plans; • a good capacity should be present within agencies to handle operational crisis; • personal and material resources should be present to the extent required to handle crisis.
Methods used	• physical documents; • expert opinion; • interviews and questionnaires; • information from public sources; • activity reports of auditees and annual reports.
Findings	• The Swedish government does not have a solid base for decisions concerning whether or not actions taken are sufficient to prevent large-scale crises in national power supply. • In case of a power failure on national scale, the Swedish agencies have a certain degree of preparedness to handle the crises, but summing up, the ability to cope with such crises is insufficient.

Energy-performance certificates: Poor value for money

Country and year of publication	Sweden, 2009
Type of audit	Performance
Audit form	Individual
Audit objective	The purpose of the audit is to assess whether the Government and the government agencies responsible have created good conditions for the system of energy-performance certificates to promote energy efficiency. It should also assess whether the agencies' application of the legislation is such that it promotes compliance with the overall objectives in the field.
Audit scope	• Ministry of Enterprise, Energy and Communications; • Ministry of Environment; • Government agencies.
Audit criteria	The audit criteria are set in the EU Directive on the energy performance of buildings and the Energy Performance Certificates for Buildings Act.
Methods used	• documents reviews; • interviews; • analysis of the system.
Findings	• Little advice for the money – 48% of all certificates do not include any recommendations for measures to enhance energy efficiency; • Delays in implementation and application of the rules set in the Directive; • Points of unclarity relating to inspections and recommendations in Swedish legislation; • The direction exercised by the Government is not linked to the overall objectives for the energy efficiency; • Inadequate division of responsibility; • The system of energy-performance certificates overlaps with other policy instruments; • The certification and accreditation system does not fulfil its purpose; • Inadequate follow-up of the content of energy-performance certificates, the functioning of the system, investments prompted by energy-performance certificates, and other matters; • Municipalities have been encouraged not to exercise supervision.
Recommendations	• For the Government: Ensure the timely implementation of EU Directives, make all bodies of rules clearer and simpler, formulate monitorable sub-objectives for energy-performance certificates, ensure that energy-performance certificates are coordinated with other instruments, ensure the quality of certificates and the independence of experts. • For the Government agencies: Make sure that the register of energy-performance certificates can retrieve the information necessary to monitor and evaluate the effect that energy-performance certificates exert on energy consumption.

Renewable Energy: Options for Scrutiny

Country and year of publication	UK, 2008
Type of audit	Other – see the explanation in audit objective section
Audit form	Individual
Audit objective	The report was a briefing for the House of Commons Environmental Audit Committee. It set out what is meant by renewable energy, the targets and objectives for renewable energy in the UK, progress to date against these targets, and the barriers to the further expansion of renewable energy in the UK. The report described the policy landscape, the responsibilities of the various organisations involved, and the range of programmes and policy instruments in place.
Audit scope	This briefing is not a performance audit, and the main objective was to set out the policy landscape clearly and describe the range of policy instruments in place. It also covers renewable energy generation.
Audit criteria	The briefing was descriptive rather than evaluative, but did set out key targets for the UK: • the EU's proposed target is for the UK to achieve 15% of its energy consumption from renewable sources by 2020; the current figure is 1.4%; and • other targets have been set, by both the EU and the UK, for the proportion of energy used for transport and supplied for electricity that should be sourced from renewable sources.
Methods used	• content analysis – documents on renewable energy ; • statistical analysis of secondary data; • economic analysis – cost comparisons.
Findings	This briefing was descriptive rather than evaluative, though it does highlight the scale of the challenge facing the UK in meeting the EU renewable energy target and the nature of the barriers preventing faster take-up.

Department of Energy: Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs

Country and year of publication	USA, 2006
Type of audit	Performance
Audit form	Individual
Audit objective	• Research and Development (R&D) funding trends for developing advanced energy technologies; • Key barriers to developing and deploying advanced energy technologies; • Efforts of the states and six selected countries to develop and deploy advanced energy technologies for wind, and other RERs, clean coal and nuclear power generation.
Audit scope	• Department of Energy (DOE)
Audit criteria	Each year the United States Congress appropriates funds for DOE's R&D on renewable energy, fossil energy and nuclear energy. The United States Congress has enacted legislation providing tax incentives for business to deploy advanced energy technologies.
Methods used	• Document and reports analysis (R&D funding data from 1978 through 2006); • Interviews with the Department of Energy officials and scientists, industry executives, and representatives and scientists from universities and other non-profit organizations.
Findings	• It is unlikely that the Department of Energy's current level of R&D funding or the nation's current energy policies will be sufficient to deploy alternative energy sources in the next 25 years that will reverse their growing dependence on imported oil or the adverse environmental effects of using conventional fossil energy; • Without sustained high energy prices or concerted, high-profile federal government leadership, U.S. consumers are unlikely to change their energy-use patterns; • Several states have taken the lead in encouraging the deployment of advanced energy technologies, particularly in renewable energy.
Recommendations	The United States Congress should consider further stimulating the development and deployment of a diversified energy portfolio by focusing R&D funding on advanced energy technologies.
Impacts	Since the report was issued in December 2006, the United States Congress has substantially increased funding to develop and deploy renewable and other advanced energy technologies. The United States Congress has also extended tax incentives, including the Production Tax Credit for wind energy and the Volumetric Ethanol Excise Tax Credit for ethanol.

Replacing trees logged as biomass ensures the sustainability (© Sylva Müllerová)

Annex 2:
Examples of criteria from international agreements

United Nations Framework Convention on Climate Change

According to Art. 2, the ultimate objective of this Convention is, in accordance with the relevant provisions of the Convention, a stabilization of greenhouse gas concentration in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

Generally, it is possible to submit that the Convention contains several provisions which are utilizable as audit criteria in the renewable energy resources field. As stated above, these represent only indirect criteria and therefore it is in necessary to provide further explication.

For example, the provision in Art. 4 par. 1 letter b) (see below) of the Convention does not regulate the issue of sustainable energy directly. Explication of this Convention brings to a conclusion that programmes containing measures for climate change mitigation (reducing anthropogenic emissions) help to support sustainable energy at the same time.

Example: the provision of the Art. 4 par. 1 letter b) of the Convention:

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, shall:

...

Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not controlled by the Montreal Protocol, and measures to facilitate adequate adaptation to climate change.

Kyoto Protocol

The Kyoto Protocol to the United Nations Framework Convention on Climate Change was adopted in December 1997 during the third conference of the signatory powers in Kyoto.

There are significant utilizable criteria for the audit of RERs. For example:

Art. 2 par. 1 letter a) points 1, 4, 5, 6

Each Party included in Annex I, in achieving its quantified emission limitation and reduction commitments under Article 3, in order to promote sustainable development, shall:

(a) Implement and/or further elaborate policies and measures in accordance with its national circumstances, such as:

(i) Enhancement of energy efficiency in relevant sectors of the national economy;

…

(iv) Research on, and promotion, development and increased use of, new and renewable forms of energy, of carbon dioxide sequestration technologies and of advanced and innovative environmentally sound technologies;

(v) Progressive reduction or phasing out of market imperfections, fiscal incentives, tax and duty exemptions and subsidies in all greenhouse gas emitting sectors that run counter to the objective of the Convention and application of market instruments;

(vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which limit or reduce emissions of greenhouse gases not controlled by the Montreal Protocol.

Art. 10 letter b)

All Parties, taking into account their common but differentiated responsibilities and their specific national and regional development priorities, objectives and circumstances, without introducing any new commitments for Parties not included in Annex I, but reaffirming existing commitments under Article 4, paragraph 1, of the Convention, and continuing to advance the implementation of these commitments in order to achieve sustainable development, taking into account Article 4, paragraphs 3, 5 and 7, of the Convention, shall:

…

Formulate, implement, publish and regularly update national and, where appropriate, regional programmes containing measures to mitigate climate change and measures to facilitate adequate adaptation to climate change:

(i) Such programmes would, inter alia, concern the energy, transport and industry sectors as well as agriculture, forestry and waste management. Furthermore, adaptation technologies and methods for improving spatial planning would improve adaptation to climate change; and

(ii) Parties included in Annex I shall submit information on action under this Protocol, including national programmes, in accordance with Article 7; and other Parties shall seek to include in their national communications, as appropriate, information on programmes which contain measures that the Party believes contribute to addressing climate change and its adverse impacts, including the abatement of increases in greenhouse gas emissions, and enhancement of and removals by sinks, capacity building and adaptation measures.

Examples of other significant international agreements:

- Convention on Long-range Transboundary Air Pollution (signed in 1979 in Geneva);
- Protocol to the 1979 Convention on Long-range Transboundary Air Pollution on the Reduction of Sulphur Emissions or their Transboundary Fluxes by at least 30 per cent (signed in 1985 in Helsinki); and
- Convention on Environmental Impact Assessment in a Transboundary Context/Espoo Convention (signed in 1991 in Espoo).

Annex 3:
Examples of criteria from EU legislation

Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market: For electricity generated from renewable energy sources in 2010, the Directive sets the indicative target of 21% of the Community-wide gross consumption. It defines the national indicative targets for each Member State, promotes the utilization of national support schemes as well as the elimination of administrative barriers and integration of the interconnected grid, and charges the Member States with the duty of issuing guarantees of origin to undertakings generating energy from RERs. Based on the current policies, a share of 19% can be expected to be reached by 2010.

Directive 2002/91/EC on the energy performance of buildings: The Member States are called upon to implement policies focused on upgrading the energy standards of buildings. Integration of renewable energy in buildings and a systematic approach to interlinking the renewable resources with the energy efficiency sector are accorded the highest priority.

Directive 2003/30/EC on the promotion of the use of biofuels or other renewable fuels for transport: The Directive sets the target share of biofuels at 5.75% of all fuels for transport introduced on the market as of 31 December 2010. The Member States were requested to set their indicative targets for 2005 taking into account the reference value of 2%. This partial objective has not been attained. The 2005 share of biofuels in the overall volume of fuels used for transport constituted 1%. It follows from the evaluation by the European Commission of the progress achieved in implementing this directive that the target set for 2012 is unlikely to be attained. The share actually expected to be achieved is no more than 4.2%.

Directive 2006/32/EC on energy end-use efficiency and energy services: The Member States are called upon to launch programmes to boost energy efficiency. The Member States will develop their national action plans to boost the energy efficiency during the 2007-2017 period. The process will be subject to evaluation by the European Commission.

Annex 4:
Guide for carrying out audit on grants

Audit of grants on the side of the grant provider

Phase 1

Audit of methodological and conceptual work in the field of grant provision for support of generation and savings of energy from RERs.

Phase 2

Audit of programmes in the field of grants for support of generation and savings of energy from RERs.

Phase 3

Audit of governance and administration of grant programmes for support of generation and savings of energy from RERs.

Phase 4

Audit of organizational and supervisory activities regarding state funds that are allotted for measures to support usage/generation and savings of energy from RERs.

Phase 5

Audit of ongoing monitoring from the side of grant provider and a level of final assessment.

Phase 1

- Audit of, e.g., background materials analysis, which represents a base for setting priorities and objectives of an energy policy/ programme.
- Audit of preparation, realization, and assessment of energy policy/programme.
- Audit of completeness, exactness, and correctness of objectives setting.
- Audit of setting of appropriate instruments to achieve objectives.

Phase 2

Audit or assessment of programme preparation, in particular if grant provider specified:

- concrete, achievable, and measurable objectives;
- priorities and measures and their fulfilment;
- beneficiaries;
- assessment criteria and selection methods for projects;
- financial framework with allotment according to priorities and measurements;
- amount of grant allotted;
- eligible/ineligible costs;
- programme time management;
- programme monitoring indicators and its priorities and measures;
- information content and methods for its collection for ongoing monitoring of financial and factual programme implementation and its final assessment; and
- mechanism for governance, financial control, monitoring, and programme assessment.

Phase 3

This phase of audit comprises a provider's verification of whether:

a. in the framework of administrative and financial management:
   - a conclusive register of accepted grant requests was kept;
   - a control of formal correctness of grant requests was conducted – this means: was an appropriate form used, were the correct number of grant request copies provided, and did the form comprise all necessary data and obligatory annexes;
   - an assessment and selection of projects and applicants was carried out according to prior specified acceptability criteria in compliance with:
     - effectiveness, necessity, contribution, risks and sustainability of projects and its accordance with programme objectives and measures;
     - characteristics and financial health of applicants which are assessed according to parameters and indicators specified by the programme administrator (provider);
     - scales application (binary, ordinal and cardinal) and weights applications (expert determination of weights, method of paired comparisons or progressive allocation of weights);
   - an objective report on requests assessment and the selection process for applicants was prepared;
   - there was communication in a written form with successful applicants about their inclusion on the list of projects nominated for approval and whether, with appropriate declaration, unsuccessful applicants were informed of their disqualification;
   - deadlines for individual phases of administration were stipulated and kept (this means for acceptance and control of formal requirements of grant request – assessment and selection of applicants and their projects; for preparation and issuing of a grant agreement).

b. issued a grant agreement containing specified requirements, based on an approved grant request, or a contract was arranged with prescribed requirements.
c. funds were allotted upon prior stipulated rules and in accordance with legislation, and accounting records were kept in the framework of the programme and in accordance with legislation.

Phase 4

Audit comprises an assessment of:

- a level of organization and governance on the grant provider side;
- a level and extent of control of beneficiaries conducted by a provider; and
- a level of internal control on the side of a provider.

Phase 5

a) An audit of monitoring comprises an evaluation of monitoring management, fulfilment of project parameters, evaluation of the success of programmes, bookkeeping of usage of means allotted for the project in accordance with legislation, and furthermore, in particular, if a provider:
   - stipulated a form and content of information on realization of a running project (progressive monitoring reports) to beneficiaries in grant agreements; and
   - specified a content and a form of information distribution on project sustainability in a grant agreement for beneficiaries.

b) Audit on a final assessment comprises an evaluation of system assessment level, in particular if a provider:
   - stipulated a deadline for a final project assessment presentation in a grant agreement for beneficiaries; and
   - elaborated a final programme assessment with all prescribed requirements.

Audit of grants on the side of beneficiaries

Phase 1

Audit on completeness and correctness of data presented in a grant request

Phase 2

Audit on a selection of contractors and suppliers – a compliance with Act on public procurement

Phase 3

Audit on project execution, a compliance with a grant agreement, an analytic project accounting

Phase 4

Audit on achievement of planned parameters and fulfilment of stipulated objectives in the field of generation and savings of energy from RERs

Phase 1

Audit examines correctness of data in a grant request by which a provider decided on a grant allotment.

Phase 2

Audit verifies a tender process from the side of grant beneficiaries. Audit comprises a verification of, e.g.:

- selection of an appropriate tender process;
- a method in case of short-range orders;
- a level of a preparation of contractual documents; and
- requirements on bid prices.

Phase 3

This phase comprises particularly:

- compliance audit of project execution with legislation;
- compliance audit of grant agreement with contractual documents and with conditions stipulated in a bid;
- compliance audit of a contract with supplier with grant agreement, eventually with grant conditions;
- audit of fulfilment of contracts with suppliers;
- audit of invoices, completion certificates, meeting of deadlines of realization and delivery and acceptance;
- compliance audit of maximum share of grants on total costs (if specified);
- audit on presentation of monitoring reports, requests on changes in grant agreement; and
- audit on separated project bookkeeping (analytical account).

Phase 4

Audit in the framework of this phase includes:

- audit on meeting deadlines from the side of beneficiary, audit of completeness and correctness of documents presented for ongoing monitoring and final assessment of the project; and
- audit on operating statements handover about achieving the project parameters.

Annex 5:
Issue Analysis

The Issue Analysis was developed by the NAO as a means to deliver audit reports that are focused and logically rigorous. The Situation-Complication-Question (S-C-Q) structure provides the starting point for the Issue Analysis (Situation + Complication = Main study question).

The logical linkages between the levels of audit questions can be described through a metaphor - a tree. The main study question can be seen as the trunk of the tree, Level 2 sub-issues are the main branches, Level 3 sub-sub issues are the tributary branches, and the Level 4 sub-sub-sub issues are the twigs. The audit tasks, which comprise a specific question and the method by which the auditor will answer it, are the leaves of the tree.

As water and nutrients feed all parts of the tree via the trunk, so the leaves in the Issue Analysis tree derive their logic from the main question by way of the branches, tributary branches, and the twigs (deductive logic). The same process works in reverse, meaning that we can check the logic by assessing whether the leaves are on the right twigs, the twigs on the right tributary branch, etc. (inductive logic).

The tree must be Mutually Exclusive and Collectively Exhaustive (ME/CE). This provides logical structure to our arguments. Mutually Exclusive issues are different and distinct from one another - they do not overlap. A Collectively Exhaustive set of issues is the full range of relevant issues on the subject, which together are sufficient to answer the higher-level questions.

There are many techniques that could be used to produce the single question that defines the scope of the audit. But we have found this technique, or some variation of this (such as “ploughing the field” with multiple situations and complications) to be the most useful.

Issue Analysis involves yes/no questions in order to provide focus and clarity. Phrasing questions in this form permits us to direct our analysis to a specific end-product needed to prove or disprove our understanding of the problem. By contrast, a report which “seeks to examine how the work of Agency X has changed since Policy Y” can easily become “everything we know about Agency X”. Even if the subject is reduced to a single question but of a kind not answerable by yes/no (e.g. questions beginning “how well ...” or “how successful ...”), there is a risk that we cannot gather sufficient evidence to answer this question conclusively or that we do not know whether we have an answer or not. In other words, too much is left to assertion, which is not a good basis for working out a clear report that is supposed to be grounded in evidence.

There are two important practical rules to follow when using Issue Analysis. The Rule of Seven, which states that the number of sub-issues for any given issue should not exceed seven. This rule is to do with clarity rather than rigour. Most people cannot retain more than seven items in their short-term memory. So, if the answer to a given issue consists of more than seven sub-issues, it is an answer that most readers will not readily remember. So while we cannot prove mathematically that no more than seven sub-issues will always be sufficient to answer any issue, it is a very good rule of thumb to think again if we ever find ourselves wanting to state more than seven sub-issues. Invariably, a higher number of sub-issues can be re-grouped without violating the ME/CE rules.

Although it may seem obvious, it is useful to also follow a further practical rule - the Rule of One. Under the Rule of One, the number of sub-issues must always exceed one. If you find you have an issue with only one sub-issue underlying it then you are either missing some sub-issues or merely restating the issue in another form.[9]

Some SAIs prefer the NAO UK methodology when formulating audit questions (e.g. Norway and Czech Republic), other SAIs (e.g. Austria, Denmark, and Switzerland) use modified methods for formulating audit questions, which differ, in particular, by levels of audit questions and by their types (open). Further options for the tree design consist in formulating a hypothesis as the last level of these questions. The results of the international EUROSAI Training Event on performance auditing[10] confirmed that it is not possible to consider any of these formulated audit questions as the “bad ones”. They have both advantages and disadvantages and depend on the level of sophistication that the SAI has decided to use.

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[9] Source: User Guidance The Issue Analysis Dinner Party Approach, NAO UK, 2003.

[10] EUROSAI Training Event: Experience with the implementation and development of performance audits in reaction to challenges and opportunities in a changing environment; 27-29 April 2009 Prague, Czech Republic.

Annex 6:
Summary of information from the questionnaire survey

One of the sources for the preparation of this manual was an analysis of a standardized questionnaire sent to individual SAIs.

The Supreme Audit Office of the Czech Republic received from November 2008 to May 2009 in total 60 duly completed questionnaires, of which the most were sent by European SAIs (29), followed by SAIs from Asia (13), Africa (5), South America (4), Middle America (3), Australia (2), North America (2), and South Asia (2).

The **first part of the questionnaire** was focused on each individual SAI's experience in auditing not only in the field of renewable, but also in the field of non-renewable, energy resources since 2000. Furthermore it probed future plans of SAIs for carrying out audits of this kind as well.

Only one quarter of respondents stated that they have experience in auditing in the field of energy production and energy savings from non-renewable energy resource or renewable energy resources (e.g. USA, Canada, Japan, Germany, Poland, and Brazil).

22 SAIs, mostly the European ones, carried out an audit which was not directly focused on the issue of renewable energy resources; nevertheless, the audit topic was related to energy issues.

One half of the 60 SAIs that responded to the questionnaire plan to conduct an audit of energy in the future. For example, an audit focused on energy savings and energy savings policy (the Netherlands, Montenegro, and the Bahamas), a performance audit focused on sustainable energy and energy efficiency (Malta), an audit of wind energy production (Austria), and an audit of national policy of renewable energy resources (Indonesia).

The **second part of the questionnaire** was more concrete and its objective was to find out some details about audits that had already been conducted in the energy field.

The questionnaire, which used single questions, surveyed: the objectives of the audits; the audit type (performance, financial, or other); the audit form (individual, joint, concurrent, coordinated); the audit area (for example, state energy policy, regional energy policy, renewable energy resources programmes, programmes for emission reduction, programmes for energy savings); audit criteria; audit methods (for example, legal analysis, SWOT analysis, benchmarking, statistical analysis); main audit findings; recommendations; and possible effects of the audit.

Most of the audits in this field (according to the questionnaires sent) were carried out by the SAI of the Netherlands (4), followed by Brazil (3). The majority of the countries conducted only one audit (e.g. Denmark, Morocco, Korea, or Columbia).

Most of the audits are available only in the native language.

The **third part of the questionnaire** was focused on general questions concerning national and international legislation and other policies and instruments related to energy in each country.

The majority of respondents stated that they have experience of at least some of the above-mentioned energy instruments in their country. Mostly, these were concerned with development and promotion of technologies related to renewable energy resources or the introduction of national programmes concerning energy savings. Some countries stated that they had experience adoption of all the energy instruments mentioned in the questionnaire (e.g. Malta, Luxembourg, Bulgaria, or Norway).

The questionnaire also probed if the mentioned energy instruments have a connection to adopted international conventions. Almost half of respondents stated a connection to the EU legislation or Kyoto Protocol (e.g. Switzerland, Finland, Israel, or the Russian Federation).

The instruments that are mostly used for renewable energy resources development are legislation and government policy; price control, and support schemes of various tax relief, tax allowances, or tax holiday.

The majority of SAIs stated that their country had experience of organizations, institutions, or agencies related to renewable energy. These included both private and public institutions, which were very diversified. The majority of the countries stated several institutions. Among those mentioned were, for example: State Energy Agency (Lithuania); National Laboratory for Sustainable Energy (Denmark); Energy National Environmental Fund (Peru); and Department of Science and Technology (South Africa).

The blank (template) questionnaire is enclosed in Annex 8 of this Guidance.

Annex 7:
List of sustainable energy audits

Country	Year	Audit title	Website link (if available)	Language
Australia	2002-2003	Energy Efficiency in Commonwealth Operations - Follow up Audit	www.anao.gov.au	English
Australia	2004	The Administration of Major Programs (Australian Greenhouse Office)	www.anao.gov.au	English
Australia	2007	Renewable Energy: Knowing What We Are Getting	www.audit.wa.gov.au	English
Brazil	2005	Evaluation of the Efficiency of the Tariff Charge of the Fossil Fuel Consumption Account an in Inducer of Tariff Moderateness for the Isolated System of Energy	www.tcu.gov.br	Portuguese
Brazil	2008	Environmental and Energy Audit	www.tcu.gov.br	Portuguese
Brazil	2008	Electrical Losses Audit	www.tcu.gov.br	Portuguese
Bulgaria	2008-2009	Audit of Programme "Efficient Utilization of Energy and Energy Resources"	www.bulnao.government.bg	Bulgarian
Canada	2006	Reducing Greenhouse Gases Emitted During Energy Production and Consumption	www.oag-bvg-gc.ca_	English
Canada	2001	Climate Change and Energy Efficiency - A progress Report	www.oag-bvg-gc.ca_	English
Czech Republic	2005	Management of Funds Allotted to the State Programme of Energy Saving and Renewable Energy Resources Support	www.nku.cz	Czech
Czech Republic	2009	Financial Means Allotted to Support Programmes for Energy Production From Sustainable Energy Resources and for Energy Savings Support	www.nku.cz	Czech
Denmark	2006-2008	The Electricity Emergency Preparedness in the Nordic Countries	www.rigsrevisionen.dk	Danish, extract in English
Estonia	2008-2009	State Actions for Obtaining Efficiency of Energy End-use	N/A	Estonian
Estonia	2006	Handling of issues related to rape and bio-diesel fuel by the Government	www.environmental-auditing.org	English summary, Estonian
Estonia	2005	Exploitation of Peat Resources	www.environmental-auditing.org	English
Finland	2003	The Effectiveness of Environmental Aid - Energy Aid as an Environmental Protection Instrument	www.vtv.fi	Finnish
Germany	2003	German-Latvian Environmental Protection Project for the Improvement of Energy Efficiency of Slab Buildings (Coordinated Audit Produced with Latvia)	N/A	German
Greece	2007-2008	Economic Incentives for the Realization of Private Investments on Renewable Energy and More Specifically, Independent Electricity Production form Wind Parks	www.elsyn.gr/elsyn/root.jsp	Greek
Hungary	2007	Audit on the System of Electricity Supply	www.asz.hu	English
China	2008	Audit Investigation on Bio-energy (Gasification of Crop Stalks) Collective Supply Project	www.environmental-auditing.org	English summary
China	2008	Audit Investigation on A City's Rural Area's Methane Projects	www.environmental-auditing.org	English summary
Iraq	2008	Environment Audit on Activity of Baghdad Electricity Plant	N/A	Arabic

Country	Year	Audit title	Website link (if available)	Language
Israel	2004	Air Pollution from Coal-fired Power Plants	www.mevaker.gov.il	Hebrew
Israel	2009	Energy Conservation and Utilization of Renewable Energy in the Electric Supply	www.mevaker.gov.il	Hebrew
Israel	2009	Planning for Electricity Supply Shortages	www.mevaker.gov.il	Hebrew
Japan	2006	Evaluation on operation status of facilities developed by a woody biomass related project	www.environmental-auditing.org	English summary
Korea	2006	The driving of State of the Reasonable Usage and Development of Energy	www.bai.go.kr	Korean
Lithuania	2007	Evaluation of the Allocation and Trading Scheme of Greenhouse Gas Emission Allowances	www.vkontrole.lt	Lithuanian
Lithuania	2005	Implementation of Energy Saving Projects	www.vkontrole.lt	Lithuanian
Morocco	2006	Performance Audit on the Centre of Renewable Energy Development	www.courdescomptes.ma	Arabic, French
Morocco	2007	Performance Audit of the rural electrification programme	www.courdescomptes.ma	Arabic, French
Philippines	2005	Regulatory Functions of Energy Regulatory Commission	N/A	English
Poland	2004	Audit of Thermo-modernization of housing resources from 1999-2004	http://bip.nik.gov.pl	Polish
Poland	2003	Use of Electric and Thermal Energy from Renewable Sources	http://bip.nik.gov.pl	Polish
Portugal	2006-2007	Audit on the Energy Sector Regulation	www.tcontas.pt	Portuguese
Russian Federation	2008	Audit of Legitimacy of the Closing Stage Progress of Reorganization of OAO RAO "United Energy System of Russia"	www.rao-ees.ru	Russian
Senegal	2003	Office of Energy	www.environmental-auditing.org	French
Slovak Republic	2008-2009	Audit on Management of Public Financial Means Allocated for Promotion of Energy Efficiency and Use of Renewable Resources and Investment Effectiveness	www.sao.gov.sk	Slovak
Slovenia	2007	Air and Ozone Layer Protection and Climate Change Mitigation in 2005 and 2006	www.rs-rs.si	Slovene
Spain	2003	Centre for Energy, Environmental and Technological Research	www.environmental-auditing.org	Spanish
Sweden	2007	Government actions to handle large scale power failures	www.riksrevisionen.se	Swedish
Sweden	2009	Energy-performance certificates: Poor value for money	www.riksrevisionen.se	English
Switzerland	2009	Energy Research financed by the Confederation: Establishing Priorities, Management and Coordination	www.efk.admin.ch	English
The Netherlands	2004	Renewable Electricity	www.courtofaudit.nl	Dutch
The Netherlands	2007	Grant Scheme for the Environmental Quality of Electricity Production	www.courtofaudit.nl	Dutch
The Netherlands	2005	District Heating	www.courtofaudit.nl	Dutch
The Netherlands	2007	The Price of District Heating	www.courtofaudit.nl	Dutch
Ukraine	2007	Audit of Programme for Construction of Wind Power Station	www.ac-rada.gov.ua	Ukrainian

Country	Year	Audit title	Website link (if available)	Language
Ukraine	2007	Audit of Management of the State Budget Funds Allocated for Activities Providing Energy Savings and Implementation of Energy Saving Technologies	www.ac-rada.gov.ua	Ukrainian
United Kingdom	2007	The Climate Change Levy and Climate Change Agreements	www.nao.org.uk	English
United Kingdom	2006	Climate Change Option for Scrutiny	www.nao.org.uk	English
United Kingdom	2007	The Carbon Trust - Accelerating the move to a low carbon economy	www.nao.org.uk	English
United Kingdom	2007	Energy consumption and carbon emissions in Government Departments	www.nao.org.uk	English
United Kingdom	2008	Programmes to reduce household energy consumption	www.nao.org.uk	English
United Kingdom	2005	Renewable Energy	www.nao.org.uk	English
United Kingdom	2008	Renewable Energy - Options for scrutiny	www.nao.org.uk	English
United Kingdom	2006	Emissions projections in the 2006 climate change programme review	www.nao.org.uk	English
United Kingdom	2008	UK greenhouse gas emissions: measurement and reporting	www.nao.org.uk	English
United Kingdom	2006	Cost-effectiveness analysis in the 2006 - Climate Change Programme Review	www.nao.org.uk	English
USA	2005	National Energy Policy: Inventory of Major Federal Energy Programs and Status of Policy Recommendations	www.gao.gov	English
USA	2006	Department of Energy: Key Challenges Remain for Developing and Deploying Advanced Energy Technologies to Meet Future Needs	www.gao.gov	English
USA	2007	Energy efficiency: Important Challenges Must Be Overcome to Realize Significant Opportunities for Energy Efficiency Improvements in Gulf Coast Reconstruction	www.gao.gov	English
USA	2007	Energy efficiency: Long-standing Problems with DOE's Programme for Setting Efficiency Standards Continue to Result in Forgone Energy Savings	www.gao.gov	English
USA	2008	Department of Energy: New Loan Guarantee Programme Should Complete Activities Necessary for Effective and Accountable Programme Management	www.gao.gov	English
USA	2004	Renewable Energy - Wind Power's Contribution to Electric Power Generation and Impact on Farms and Rural Communities	www.gao.gov	English
USA	2004	Geothermal Energy: Information on the Navy's Geothermal Programme	www.gao.gov	English
USA	2008	Progress in Improving Energy Efficiency and Options for Decreasing Greenhouse Gas Emissions	www.gao.gov	English
USA	2008	Electricity Restructuring FERC Could Take Additional Steps to Analyze Regional Transmission Organizations' Benefits and Performance	www.gao.gov	English
USA	2006	Energy Markets: Factors Contributing to Higher Gasoline Prices	www.gao.gov	English
Yemen	2006	Electricity Sector	N/A	Arabic

Annex 8:
Sustainable energy questionnaire template

SUSTAINABLE ENERGY

Questionnaire

Part I

The first part of the questionnaire focuses on both renewable and conventional energy resources and on the fact, whether the addressed SAIs carry out or carried out audits in this area. Please cross the proper answer, when appropriate add a comment.

1. **Has your SAI carried out an audit in the field of energy production and energy savings (electricity, heat etc.) from conventional energy resources (since 2000)?**

   Yes ☐ No ☐

2. **Has your SAI carried out an audit in the field of energy production and energy savings (electricity, heat etc.) from renewable energy resources (since 2000)?**

   Yes ☐ No ☐

3. **Has your SAI conducted an audit that was not focused on an energy issue directly, but included a relevant aspect related to energy? Please cross.**

   Yes ☐ No ☐

3.1 If your answer is yes, would you be so kind and could you provide us with an electronic version of the audit report via E-mail at projectwgea@nku.cz and highlight the part concerning the relevant aspect related to energy please.

4. **Is your SAI planning any audit on energy topic in the future? If you can specify it closer, please do it in the comment box.**

   Yes ☐ No ☐

4.1 If your answer is no, please could you explain why?

Comments:

Part II

The second part of the questionnaire contains questions focused on audits concerning energy from conventional and/or renewable energy resources.

We realize this Part II might be a bit time consuming, but we appreciate the time and effort you spend when filling it in.

If your answer to at least one of the questions No 1 or 2 in the Part I was YES, we would like to ask you to fill in the Part II.

If you have performed more audits regarding these topics, please fill in the Part II for each audit separately.

If your answer was NO, skip directly to the Part III.

A detailed description of the performed audit

As an example, we used an audit that was carried out by the SAO in the Czech Republic in 2005. This audit focused on renewable energy resources and it was a mix of performance and regularity audit.

1. Title of audit. Please fill in.

2. Define the audit objectives, please (maximum 10 lines)

The audit objectives describe what the audit team intended to achieve.

Example:

Our objective was to scrutinize the use of state means spent on the implementation of the State programme to support energy savings and use of renewable energy resources ("State programme") and of the National programme for economic use of energy and utilisation of its renewable and secondary sources for the years 2002 to 2005 ("National programme") in the competence of the Ministry of the Environment and Ministry of Industry and Trade of the Czech Republic.

3. The year when this audit was performed. Please fill in.

4. Type of audit. Please cross.

Performance ☐

Financial ☐

Other ☐

Specify what, please:

5. Audit form. Please cross.

Individual ☐

Joint ☐

Concurrent ☐

Co-ordinated ☐

6. Is a report from this audit available on the Internet? Please cross.

Yes ☐ No ☐

6.1. If yes, please provide us with link(s) where it is possible to find this report. If not, would you be so kind and could you send us it via E-mail at projectwgea@nku.cz

7. In what language(s) is the report available? Please cross.

Arabic	☐
English	☐
French	☐
German	☐
Spanish	☐
Other language	☐

Specify what:

8. What areas concerning energy were audited? Please cross.

International liabilities (including compliance with the national legislative system)	☐
State energy policy	
Regional energy policy	☐
	☐
Programmes for renewable energy resources	☐
Programmes for secondary energy resources (e.g. incinerators)	☐
Programmes for reduction of emissions	☐
Programmes for new technologies with low level of energy consumption	☐
Programmes for saving of energy (grid network, minimization of heat losses)	☐
Programmes helping public to save energy more effectively (e.g. company consulting energy issues, public education)	☐
Programmes for biofuels, incl. bioethanol	☐
Production of electricity and heating industry	☐
Nuclear energy	☐
Others	☐

Specify what:

9. Define the audit scope, please (maximum 10 lines)

It includes the subject of an audit, activities, auditees, the period audited, and what the audit covers.

Example:

The audit scope included:

- Ministry of Environment, Ministry of Industry and Trade, State Environmental Fund of the Czech Republic, Czech Energy Agency, State Energy Inspection and 40 selected beneficiaries.
- The audited period was the years 2001 to 2004, the prior and following periods were taken into account where relevant.
- Fulfilment of objectives of the National programme to achieve a specific proportion of energy production from renewable energy resources in energy consumption.

10. Define the audit criteria, please (maximum 10 lines)

The criteria are the standards or indicators used to determine whether the programme, activity, project, or auditee achieved or exceeded the expected performance. The assessment whether the criteria were met or not results in an audit observation and in audit findings.

Example:

The criteria set in the National programme:

- increase a proportion of 5,1% of energy production from renewable energy resources on gross electricity consumption by 2005
- reduction of specific emissions

The sources of criteria were:

- Rules set by law, regulations, or the government
- Indicators and parameters set by government
- International conventions

11. Describe informational sources used to gather documents for the audit, please (maximum 10 lines)

Example:

- Physical document
- Expert opinion
- Interviews and questionnaires
- Statistical data
- Information published on the Internet, in press, public registers and portals
- Activity reports of auditees, annual reports
- Accounting and financial statements
- Surveys, focus groups, and the like.

12. Define methods used to analyse documents, please (maximum 10 lines)

Example:

- Legal analysis (analysis of legal environment)
- SWOT analysis
- Risk analysis
- Content analysis
- Benchmarking
- Economic analysis (cost-benefit analysis, cost-effectiveness analysis…)
- Statistical analysis (regression analysis, analysis of multi-variance)
- Performance assessment (good practice)
- Decision analysis
- Evaluation of (environmental) programmes (counter-factual situation)

13. Summarise briefly your main audit conclusions, please (maximum 10 lines)

Example:

- The aims and expected results had not been continuously achieved in the running State programme.
- Considering the existing development and with respect to the planned implementation of new renewable energy resources in 2005 it results that the main goal of the National programme “to achieve a proportion of 5,1% of energy production from renewable energy resources on gross electricity consumption” will be not realized.

14. If possible, summarise your main recommendations and decisions, please (maximum 10 lines)

Example:

- We recommended defining an optimal composition of renewable energy resources based on economical potential and investment demands of individual renewable energy resources in the State programme; it means eligible final proportion for biomass use and use of solar, wind, water, and geothermal energy.
- We recommended the government to coordinate strictly activities of the Ministry of Industry and Trade and Ministry of the Environment, which are responsible for the National programme implementation and to strengthen competences of other state administration bodies and municipalities to influence an effective and economic management of state means.

15. If possible, summarise the main impacts, please (maximum 10 lines)

Example:

- Ministries conducted a basic analysis enabling a regulation of subsidies for individual renewable energy resources with the aim to fulfil the liability of the Czech Republic concerning the proportion of electricity production from renewable energy resources on the total energy consumption.
- Based on the audit conclusions, an integrated information system of the Czech Energy Agency was put into service.

16. Does your SAI carry out an analysis of risks/barriers/limitations/difficulties during planning, performance, and evaluation of audits in the field of energy production and energy savings? (It means – is applied a risk-based approach?). Please cross.

Yes ☐ No ☐

16.1. If yes, stipulate what is investigated. Please cross or fill in.

a. Insufficient SAI's legal mandate ☐
b. SAI does not carry out a performance audit ☐
c. Lack of qualified auditors in this field ☐
d. Other priorities of audit goals stated by national parliaments ☐
e. Insufficient cooperation with external experts ☐
f. Getting relevant audit document ☐
g. Competences ☐
h. Professional knowledge of auditors ☐
i. Communication with auditees ☐
j. Other risks/barriers/limitations/difficulties. Please specify what:

17. Does your SAI have any advice for other SAIs considering auditing sustainable energy?

Example:

- How to scope the study
- Identification of questions
- Information sources
- Identification of findings etc.

Comments:

Part III

This part of the questionnaire focuses on general questions related to national and international legislation and other policy instruments related to energy. Please fill in or indicate (cross) the right answer.

1. Has your country adopted any energy instruments concerning renewable energy resources on the national level (e.g. energy policies/conceptions/ programmes)?

Yes ☐ No ☐

1.2. If yes, are the adopted energy instruments focused on:

a. development and propagation of technologies concerning renewable energy resources

Yes ☐ No ☐

b. development and propagation of effective energy resources use

Yes ☐ No ☐

c. introduction of national programmes for energy savings

Yes ☐ No ☐

d. strengthening of national and regional energy institutions or measures

Yes ☐ No ☐

e. other measures

Yes ☐ No ☐

if yes, specify what:

2. Do these energy instruments have any connections to adopted international conventions (liabilities)? Please cross.

Yes ☐ No ☐

2.1. If yes, please specify what:

3. What types of instruments are used to develop renewable energy sources? (e.g. tax relief, price control, legislation)? Describe them briefly please.

4. Does your country have any research and/or development agencies/ institutes/organizations (private or public) for renewable energy? Please cross.

Yes ☐ No ☐

4.1 If your answer is yes, could you specify it briefly?

Comments:

Glossary

Audit criteria

Criteria are benchmarks against which the subject matter should be assessed.

Audit objective

Precise statement of what the audit intends to accomplish and/or the question the audit will answer. This may include financial, regularity, or performance issues.

Audit scope

Framework or limits and subjects of the audit.

Coordinated audit

Any form of co-operation between joint and concurrent audits. This can be either a joint audit with separate reports or a concurrent audit with a single, international audit report in addition to separate national reports.

Emission trading system

According to the national allocation plans, the annual limits of greenhouse gases are allocated to the individual states. These states transfer these limits in the form of emission permits to the greenhouse gases producers. The producers can dispose of these permits for free.

Energy mix

Energy mix relates to the share of individual primary energy sources (coal, oil, gas, RERs, nuclear) in the overall energy consumption of a state or a region. Energy mix determines average amount of carbon dioxide emitted in the atmosphere to generate 1 MWh of energy.

Energy security

Energy security of a state is defined by the level of dependency of energy import or of energy resources imported from other countries, and by the level of diversification of foreign suppliers. It is influenced considerably by geopolitical situation.

Environmental Impact Assessment

Environmental Impact Assessment is an assessment of the possible impacts that a proposed project may have on the environment, together with consideration of the natural, social and economic aspects. The EIA procedure ensures that environmental consequences of projects are identified and assessed before authorisation is given. The public can give its opinion and all results are taken into account in the authorisation procedure of the project. The public is informed of the decision afterwards.

Greenhouse gases

Greenhouse gases are defined in the United Nations Framework Convention on Climate Change: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6).

Gross consumption

Amount of electricity generated, including imports and excluding exports of electricity.

Intergovernmental Panel on Climate Change (IPCC)

IPCC is an independent scientific–technical body established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of climate change and its potential environmental and socio-economic consequences.

Joint audit

Audit conducted by one audit team composed of auditors from two or more SAIs, who prepare a single audit report for publishing in all participating countries.

Parallel (concurrent) audit

An audit conducted more or less simultaneously by two or more SAIs, but with a separate audit team from each SAI reporting only to its own legislature or government and only on the observations and/or conclusions pertaining to its own country.

PPP

PPP is a form of co-operation of the public and private sectors for the purpose of using private resources and skills in the provision of public infrastructure or delivery of public services. A PPP project is based on a long-term contract relationship in which both the public and private sector share benefits and risks related to the provision of public infrastructure or public services. The pooling of experience, know-how and skills from both sectors and the transfer of the responsibility for risks to a sector with better risk management capabilities is the advantage of PPP.

Preliminary study

Once a topic has been selected for an audit, a preliminary study resulting in a work plan may be undertaken to gather information in order to be able to design an audit (primarily define the audit objectives, the scope, and the methodology to achieve the objectives).

Primary energy resources

Primary energy resources mean all consumed energy recourses (conventional and renewable) including the balance of import and export of electricity.

Risk analysis

Usually, risk does not exist in isolation. In its usual form, "risk" is a certain combination of risks, which can mean threat for a relevant subject, for example from the point of view of reaching the set aim. Qualitative (more subjective) as well quantitative (more objective, but more time demanding) methods can be used in the risk analysis. The choice of methods depends on the type of risk, the aims that should be reached by this analysis, and corresponds with the activities that could be critical for the subject and the recipient.

SMART

SMART is a set of rules (Specific, Measurable, Aligned, Realistic, Timed) that help to effectively define the frame or aim of the project and its proposed solution. The SMART rules can be applied in other areas as well, especially where the aims should be defined highly effectively in order to reach these aims.

Strategic Environmental Assessment

SEA is a process to ensure that significant environmental effects arising from policies, plans, and programmes are identified, assessed, mitigated, communicated to decision-makers, monitored, and that opportunities for public involvement are provided. Some of its benefits are: support for sustainable development, improvement of the evidence base for strategic decisions, facilitation and respondence to consultation with stakeholders, and influence on other processes such as Environmental Impact Assessment of individual development projects.

Sustainable development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainable energy

In our Guidance, we define sustainable energy as energy which, in its production or consumption, has minimal negative impacts on human health and the healthy functioning of ecological systems, including the global environment, and that can be supplied continuously not only to present, but also to future generations without putting a burden on them.

SWOT analysis

SWOT analysis is a method of qualitative evaluation which includes strategic analysis procedures and is based on classification and evaluation of individual factors, which are divided into four basic units: SW – strengths, weaknesses – aimed at internal factors (internal subject/project environment); and OT – opportunities, threats – aimed at external factors (external environment affecting subject/project).

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