

**Cohesion policy funds support to renewable energy generation — has it achieved good results?**

**Special Report 6/2014**



**BACKGROUND AND AUDIT PLANNING**

In this performance audit on the results achieved by the cohesion policy funds support to renewable energy generation, the Court sought to answer the question whether the two most important funding sources among EU spending programmes for promoting renewable energy – the European Regional Development Fund and the Cohesion Fund – achieved good results. In 2007, the Council adopted the Energy and Climate Change Strategy and set a new legally binding EU target of 20% of energy from renewable sources in the energy mix by 2020, and the contribution from these two funds to meeting this target in the 2007-2013 period amounted to 4.7 billion euro.

Energy from renewable sources can stem from a range of resources, such as from the sun, wind, water, earth or biomass. It is important for improving the security of energy supply in the EU, reducing its dependence on fossil fuels but also its carbon dioxide emissions. Moreover, in times of mounting pressure on the EU's and the Member States' budgets and scarce finite conventional fossil energy sources, initiatives for promoting energy from renewable sources can benefit EU citizens by enhancing regional development, creating growth and jobs, boosting EU's industrial competitiveness, and improving local environments.

The objective of the Court's audit was to assess whether the audited projects achieved good results. More precisely, the Court looked at whether the projects were implemented and delivered outputs as planned and whether they attained their energy production targets. We also looked at the extent to which the projects contributed to achieving the EU 2020 target. The principal concept we used in the audit was that of cost-effectiveness, by comparing costs with achieved effects or outcomes. A cost-effective investment is the least-costly alternative for achieving a given level of performance, or, the highest level of performance alternative for a given level of cost.

**METHODOLOGY, CONCLUSIONS AND RECOMMENDATIONS**

The audit results were derived from an examination of completed renewable energy generation projects from nine operational programmes financed through the ERDF or the CF in Austria, Finland, Malta, Poland and the United Kingdom. The projects were in the biomass, photovoltaic (PV), solar thermal and wind energy sectors.

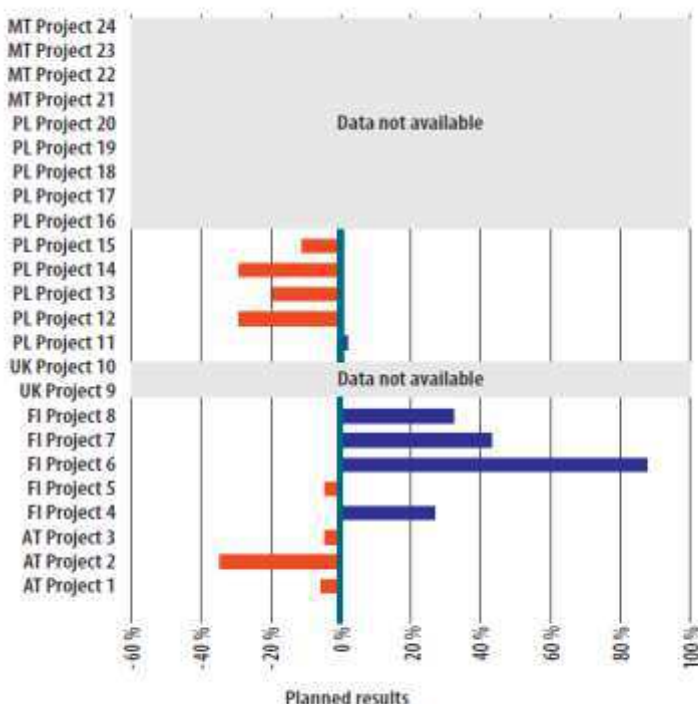
The audit work included the following main audit procedures:

- a) An analysis of the use and absorption of the ERDF/CF for RES upon supply of the relevant data concerning pre-selected Operational Programmes in 5 MS and clarification with the managing authorities of the reasons for lower than planned absorption of the allocated funds;
- b) A direct testing of a sample of 24 RES production projects in the 5 MS, interviews and evidence collection at the Commission, managing authorities and other national and regional administrations, and at the premises of beneficiaries / project owners;
- c) A review of financial, operational, monitoring, evaluation and audit reports on the performance of the individual projects and the related OPs;
- d) A review of the EU and national / regional regulatory framework, minutes of the meetings of the monitoring committees and like documents as well as a documentary review of the ERDF/CF management systems established in the selected Member States combined with on-the-spot visits.

The ECA found that the audited projects delivered outputs as planned, and most of them were sufficiently mature and ready for implementation when selected. There were no significant cost overruns or time delays in the projects, and the renewable energy generation capacities were installed as planned and operational. However, the energy production results were not always achieved or not properly measured.

The overall value for money of Cohesion policy funds support to renewable energy generation projects has been limited in helping achieve the EU 2020 renewable energy target, because: cost-effectiveness has not been the guiding principle in planning and implementing the renewable energy generation projects; and cohesion policy funds had a limited EU added value. Of 13 out of the 24 audited projects, in which energy generation results were actually measured, the targets were attained in only 5 projects, and almost attained in 3 further projects. The remaining projects did not reach or only partly reached their production targets..

**Comparison of average planned and actual energy generation in audited RES projects with measured energy generation results, 2009–12, in %**



Source: Court's own calculations based on 'QM Heizwerke' database (Austria), information about average investment costs of similar projects (Finland and Poland); project financing agreements, information about project results calculated by beneficiaries.

The EU auditors recommend that:

- (1) The Commission ensure that future Cohesion policy co-funded renewable energy programmes are guided by the principle of cost-effectiveness, including the avoidance of deadweight. Programmes must be based on proper needs assessment, prioritisation of the most cost-effective technologies (while not discriminating between renewable energy sectors) and optimal contribution to the EU renewable energy 2020 target. Adequate renewable energy generation objectives in relation to the budget as well as project selection criteria with a focus on the cost-effectiveness of the energy generation results (avoiding over-compensation of projects) need to be set;
- (2) The Commission promote the establishment by the Member States of a stable and predictable regulatory frameworks for renewable energy in general, along with smoother procedures for the integration of electricity from renewable energy into the grid networks; and
- (3) The Member States should establish and apply, based on Commission's guidance, minimum cost-effectiveness criteria which are adapted to the projects' circumstances. They should also enhance the added value of cohesion policy funds by improving renewable energy project implementation as well as monitoring and evaluation and by building a stock of measured data about energy generation costs in all relevant renewable energy sectors.

## **IMPACT OF THE AUDIT**

The Commission accepts the recommendations and states that its guidance for the design of renewables support schemes should be taken into consideration by Member States. The forthcoming Energy and Environmental Aid guidelines will also contribute to increasing the cost-effectiveness of Member States support schemes for renewable energy.

The Court's recommendations should serve to improve the programming, management and supervision framework, notably the relevant projects on the ground, of future ERDF/CF investments in RES which will likely increase considerably in the 2014-2020 financial period.

The Commission through its work with the Member States will advise managing authorities to include the recommendations of the European Court of Auditors into the selection process and selection criteria of RES projects.

## **CHALLENGES AND BARRIERS**

### ***Shared management***

Managing authorities, intermediate bodies and certifying authorities are in charge of managing the implementation of the operational programmes. Project funding is subject to rules and conditions laid down partly at EU16 and partly at Member State level (project selection; project cost, benefit and earnings assessments; and also economic, social and environmental impact assessments are responsibilities of the Member States' authorities).

### ***Availability and comparability of data***

The preparation of the RES projects has been insufficient for effective monitoring and evaluation. The objectives and performance indicators set in all operational programmes audited were imprecise and not based on reliable baseline data. Thus, the projects in the same or different RES sectors could not be compared; nor could the contribution of the EU funds to the EU and national RES targets be verified by the competent authorities.

### ***Deadweight***

The cohesion policy funds had a limited EU added value, which, according to the Commission, is “the value resulting from an EU intervention which is additional to the value that would have been otherwise created by Member State action alone”. The purpose of the EU money should be to support actions which could not otherwise take off due to financing gaps or lack of economic incentives. Non-justified high co-financing rates (which varied between 2 % and 85 %) increased the risk of deadweight (that is, EU funds replacing private or national funding), and reduced the number of supported renewable energy generation projects.

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[http://www.eca.europa.eu/Lists/ECADocuments/SR14\\_06/SR14\\_06\\_EN.pdf](http://www.eca.europa.eu/Lists/ECADocuments/SR14_06/SR14_06_EN.pdf)

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*The 16<sup>th</sup> meeting of working Group on  
Environmental Auditing*

**Auditing performance of Renewable Energy  
in Iraq**



***Federal Board of Supreme Audit  
Iraq  
2014***

## Renewable Energy

### 1-Importance of the Subject: -

Energy is the nerve of modern life and the main engine of industrial progress and technological development in particular, and economic progress in general, energy is a focal point for human life today, the modern civilization has depend on the energy in its different- resource to convert economic resources from its initial form to final form that is capable of satisfying the many and varied needs and desires, as it is an important factor in achieving economic and social welfare.

### 2- Goals and Scope of the Audit and Standards:

#### A-scope of the audit:

The scope of audit includes Ministry of electricity projects related to use solar energy as a source of electricity. Auditing on the performance of Ministry of Electricity management in verifying the extent that Ministry of Electricity is using of solar energy as a source of electricity and the accuracy of the implementation and develop a public policy to expand the experiment and reduce dependence on traditional energies in electricity production.

#### B-Audit objectives:

Measuring the efficiency and effectiveness of using of solar energy in the production of electrical energy for street lighting and the contribution of solar energy used in lighting in reducing emissions resulting from the use of fossil fuels in the production of electrical energy.

#### (C) Adopted Standards:-

- 1 - Determinants of the World Health Organization (WHO) regarding rates of greenhouse gas emissions.
- 2- Work program of UN International Commission on Sustainable Development, about the environment and sustainable development, held

in the city of Rio de Janeiro in 1992 about reducing greenhouse gas emissions resulting from the use of electrical energy and the search for alternative sources of renewable energy.

3- policies, legislation issued by the Ministry of the Environment regarding the use of renewable energy, like using solar energy in the production of electric power, and the use of wind energy to generate electric power using a technique windmills. Iraq considers as one of the countries distinct in its wind over the year, in order to reduce the emissions of harmful gases as sulfur dioxide (SO) and sulfur dioxide (SO<sub>2</sub>) and carbon monoxide (CO).

### 3- Energy concept

Energy: is an external influence exchanged between physical objects to change their status, and power: is the ability of material to do the movement or work, that are accompanied by the movement called dynamic energy, but which are relevant to the situation are called static energy, and all that discovered today of the sources and production of energy does not exceed converted it from one form to another to take advantage of them in all aspects of life.

### 4- Reasons to use Alternative Energy

Renewable energy include in its broad sense all kinds of energy derived from solar radiation, wind energy, biomass and hydro power (in addition to the energy derived from tidal waves and the islands in the seas and oceans). The value of any energy source and its contribution to the total energy production depend on several factors including:

- 1- Providing the appropriate technology to exploitation of this source of renewable energy on a commercial basis.
- 2- Its suitability from an environmental perspective.

Recently renewable energy has a very great interest in the world, for financial and environmental reasons related to the strong rise in the price



offossil fuels, which is a burdenon the budgets of the developing countriesand the growth ofa global consciousnessanddirectedtowards the use ofrenewable energy sourcesbecause of the global warming(Greenhouse effect)and the increase inglobal temperatures, or what called (Global Warming).

Thereforemust reducing the use offossil fuelsandthe trend towardsthe use ofrenewable energyin different directions, and the most important are:

- 1-Improveenergy efficiencyand rational use.
- 2-Use energy sourcesEco-friendly (such as usingnatural gas instead ofcoal)
- 3-Expanding in theuse of renewable energyand developingits technologies andreducecost.

### 5-Renewable Energy SourcesinIraq

#### •*Hydro power:*

Thecommercial exploitationof water resourcesinIraq was through the establishment ofdams andsystems for irrigationandelectricity production(such asMosul Dam, Hamrin, Samarra, Haditha...etc), but the contribution ofhydropowerin the overall Iraq total productionabout (29000). GWHhourof 1997(not specified).Thehydropoweris one of theimportant sourcesfor the production ofenergyand the cheapest as it consider a clean energy andenvironmentally acceptable, but it needshuge investmentsforthe purpose of producingdams.

#### •*Wind Energy.*

Theprogress that hashappenedgloballyin recent yearsin the development oftechnologyto take advantage ofwind energywasvery significant progresswithincreasedefficiencyfansand its lowcost, but the wind powerremains limiteddue to thelarge spacesthat wind farms needandthe fluctuation ofproduction as a result ofthe disruption ofwind speed and direction. so fardoes not haveanydirect applicationfor the use



of wind power in Iraq, but can be applied in some areas and that after conducting a comprehensive study of all parts of Iraq for the purpose of determining the appropriate and efficient area in the terms of the speed and direction of the wind.

- *Solar Energy*

The concentration of solar energy about (one kilowatt) per square meter and that in the clear days when and at noon. This quantity is affected by this change of time during the daylight hours and the major weaknesses in the solar energy is its spread, poor and change concentrate with time. What might reach to hemisphere of radiation can not take advantage of it entirely where there are a lot of losses. In Iraq, the use of solar energy is very limited and on a small scale with the knowledge that our country enjoys high solar radioactivity with long hours during the day compared with the hours of the night, especially in summer, so it is possible to take advantage of this energy.

- *Biomass Energy :*

One of the important types of renewable energy which can be invested, especially in rural areas and this energy take several forms, including wood fuel and the remnants of agricultural products, animal dung and ethanol, not that the use of biomass energy in Iraq not subject to centralized control by the state, but are used widely in agricultural areas where animal dung is used as a resource to provide the energy needed for the production of bread in primitive furnaces in homes. The study of biomass energy in Iraq complaining of the shortage of information available there is an urgent need to develop the information base in this area and to direct higher studies and researches towards this promising energy investment.

## **6-Renewable energy Capabilities compared with fossil fuels**

That renewable energy, particularly solar and wind energy available in large quantities, but (Dispersed) and therefore, the intensity is limited and suffers from the following negatives :

- 1- Their needs for a very large area to collect and converted it into a commercial energy source, so it is both expensive and inefficient to produce energy.
- 2- It seasonal energy and non-continuous and therefore its availability is limited to certain times and not continuous, to rely on this rotation requires providing of large Energy Storage Facilities or link it with hybrid System include connectivity to traditional energy and for the purpose of compensation in the event of a decrease in the amount of energy generated from renewable energy sources.
- 3- Energy cannot be transferred until after the renewable energy converted into electrical energy and therefore must be used in its place.
- 4- The possibility of the use of renewable energy for the transport sector is very slim at this limited currently, note that the transport sector consumes about a quarter of global energy production.

In light of the foregoing, and with the exception of hydropower and biomass, the renewable energy, particularly solar energy is currently expensive and inefficient and it is hoped to obtain renewable energy with less cost and greater efficiency through the utilization of the evolution of fusing technology of renewable energy and research continuing to improve the optimal use of this type of energy and expected that renewable energy can play a big role in the global energy system.

## **7-Audit samples:**

Auditing three contracts between Ministry of Electricity and some

companies regarding the use of solar energy in electric power generation and as follows:

- Contract No. (RED / 9/2007) for lighting the streets of Baghdad to supply electricity systems work with solar power about (3150) systems .
- Contract No. (RED / 7/2008) on supplying spectacular lighting systems, solar-powered about (1050) system for lighting the streets of Baghdad.
- Contract No. (RED / 2/2006) for supplying of integrated lighting systems, solar-powered number (5000) with capacity of 66-watt system.

### 8-Practical experience

The financial control bodies in the Federal Board of Supreme Audit has audited projects relating to the use of solar energy for the production of electric power and implemented by some companies through its contract with the General Directorate for distribution of electricity through supplying it with integrated systems of lighting solar-powered through auditing the following decades:

- 1- the Iraqi Electricity office contracted to supply integrated lighting systems, solar-powered about (3150) system in accordance with the Contract No. (2007/9 / RED) to be installed in the streets of Baghdad, has been listed under the project investment budget for the year 200 under the title of lighting project streets of residential neighborhoods.
- 2- Iraqi Ministry of Electricity contracted to supply of integrated lighting systems solar- powered about (1050) under the contract (RED / 8/2007) classified on the expense of the investment plan in condition to be from origins of (Japan, Germany, Italy, UK, Hungary) on the basis of a unit price (2285.71) dollars and the total price (203,990,995.5) dollars.
- 3- Iraqi Ministry of Electricity-Directorate General of Electricity Distribution in Baghdad / al-Rusafa on supplying integrated lighting systems, solar-powered about (500) in capacity of 66-watt with all its

parts and accessories from (South Korea, Japan, Germany, Italy, Britain, Hungary and Switzerland). According to the contract No. (2008/2 / RED) in amount of (12.14285 million).

## **9-Results , Recommendations and suggestions**

### **Results**

- 1- Didn't contract with companies producing the original of such systems but has been contracting with companies consolidated for this system, which has increased the cost of materials supplied.
- 2- Receiving materials, which include cells and panels that were different types of what has been contracted.
- 3- Didn't prepare a study on the economic and technical feasibility of the use of these systems and compared it with conventional-powered systems resulting from the use of fossil fuels.
- 4- Didn't submit letters of guarantee in (5%) of the value of the contract to cover the period of the contract, but instead providing letters of guarantee with expired date do not cover the duration of the contract.

### **Recommendations**

- First - working on the preparation of standards and audit evidence to cover the activities of the audit renewable energy.
- Secondly - Expanding in contracting related to import integrated systems solar-powered lighting.
- Second - Expansion in the exploitation of other renewable energies such as wind for the purpose of obtaining a sustainable alternative energy sources, renewable and cheap price.

### **Suggestions**

1 - Renewable energy: is one of the most promising sources of energy that could be invested in increasing its use in Iraq because of the problems that Iraq have in the production of electrical energy.

2 - There is an urgent need to examine the reality of renewable energy in Iraq and the development of a database include the available types with extensive study in terms of identifying trends and wind speed for the purpose of benefiting from wind energy, especially in some remote areas, which is difficult to provide wire transfer electrical energy to them.

3-directed research and HigherStudies towards the exploitation of renewable energy.

4 - Spreading environmental awareness about the utilization of renewable energy and it's the role of Ministry of Environment, especially the media center and environmental awareness.

5-Ministries of the environment and electricity implemented pilot projects) for the production of renewable energy in some areas as a first step to move towards this type of energy.



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