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## Renewable Energy in Lebanon

Although there have been several policy initiatives with respect to renewable energy in the last years, the Lebanese energy sector is still mainly relying on fossil fuels as energy resource. With the recent German policy shift away from nuclear power towards clean energies as a successful example in mind, the FES Lebanon in cooperation with local partners tries to push forward the promotion of renewable energies in Lebanon. Not only do they provide an environment-friendly way of generating energy, but they can also contribute to solving Lebanon's constant difficulties in satisfying the energy demand.

This information paper aims at providing general information on the energy sector in Lebanon as well as giving an overview of the potential of renewable energy production in Lebanon and of the most important initiatives that have been launched.

### The Lebanese Energy sector

Power is mainly derived from thermal power plants which usually combust fuel oil or gasoil. A small share of the electricity comes from hydro-power plants and a few percent are purchased from Syria. Lebanon does not have oil resources itself and thus depends on imports, rendering it highly vulnerable to changes in prices as a large

percentage of the yearly budget is spent on importing fuels. The prices in the past years have multiplied. According to the UNDP, the government spent \$ 2,1 billion USD on imported fossil fuels in 2005.<sup>1</sup> Referred to Beheshti, Lebanon paid even 4 billion USD in 2008.<sup>2</sup>

The state-run Electricite du Liban (EDL) has a strong monopoly in the supply of energy. It suffers from severe financial problems. Therefore, it relies on the government to cover its expenditures.<sup>3</sup> Overall, this means that energy is highly subsidized by the state.

In spite of these subsidies, the tariffs for consumers are significantly higher than in surrounding countries.<sup>4</sup> The monthly energy bills represent a large share of the private households' expenses, as the consumers pay the EDL and often pay as well for power generators to bridge the power cuts. Apart from being expensive these generators have high rates of emission and contribute to the already severe air pollution in residential areas.

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<sup>1</sup> UNDP Project Document "The Country Programme of Lebanon under the Global Solar Heating Market and Strengthening Initiative (PIMS 3611)", 2009, p.4.

<sup>2</sup> Beheshti (2010): 5.

<sup>3</sup> Abi Said 2005: 6.

<sup>4</sup> Abi Said 2005: 4.

## Renewable: new in Lebanon

The renewable energy sector in Lebanon is not well-developed. 97% of the energy is imported in the form of fossil fuels, while only about 2% of the energy is generated from renewable energy resources.<sup>5</sup>

- Wind

A 'National Wind Atlas' has been developed for Lebanon with the support of the UNDP. It comes to the conclusion that the potential for onshore wind energy is 6,1 GW.<sup>6</sup> Wind is generally considered the most feasible energy resource for Lebanon.<sup>7</sup> Yet, only small pilot projects have been launched by private actors.<sup>8</sup>

- Water

Globally, most of the renewable energy is generated from water. Also in Lebanon it is the most common "clean" energy resource. In 2004, 283 MW were produced by installed hydro power plants. According to a study by researchers from the American University of Beirut, there is a potential for 533 MW.<sup>9</sup>

- Sun

Sun can be used as energy resource for either photovoltaics or for solar water heating systems. Although prices have decreased during the past years,

photovoltaic panels are still comparatively expensive to install. They have been promoted in Lebanon on a local level especially by international initiatives, particularly after the 2006 war.

Several projects introduced the use of solar water heaters for private households which are very common in neighboring countries such as Jordan and Israel. Yet, other resources for water heating still prevail.

- Bio energy

Bio energy refers to energy from biomass. This includes resources that are not fossil, i.e. live or have lived, such as wood, straw or corn, but also dung. Organic waste (such as agricultural waste) and even municipal solid waste is also called a bio mass energy source ("waste-to-energy"). Even though fossil energy resources such as coal derived from living material as well, they are not counted as bio mass.

With the rising amount of waste in Lebanon, generating energy from the treatment of waste could be an option but it is very expensive. Wood cannot be considered as energy resource for Lebanon as the wood resources are limited due to deforestation.

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<sup>5</sup> Comair, Fadi (2008): 55-57.

<sup>6</sup> The Daily Star Lebanon, January 27, 2011: "Wind power can help ease Lebanon's energy woes: report"., available here: [http://www.undp.org.lb/communication/publications/downloads/National\\_Wind\\_Atlas\\_report.pdf](http://www.undp.org.lb/communication/publications/downloads/National_Wind_Atlas_report.pdf) (date of access October 27, 2011)

<sup>7</sup> Besheti 2010: 29.

<sup>8</sup> Abi Said 2005: 7.

<sup>9</sup> R. Chedid, N. Ghaddar, F. Chaaban et. al. 2004: 4.

## Political Initiatives

- In 2002, Law 462 which includes a reform of the energy sector was ratified. It was advanced by the World Bank who demanded that the energy sector should be privatized. Yet, little reforms have been implemented in the following years.
- The *Lebanese Center for Energy Consumption* was created in 2002. It is a joint project of UNDP and the Ministry for Energy and Water and addresses renewable energy and end-use energy conservation. It has carried out several pilot projects in the production of clean energy.
- Lebanon's prime Minister at the time, Saad Hariri, pledged at the *Copenhagen Climate Change Conference* in 2009 that Lebanon's share of energy from renewable resources will rise to 12% until 2020.
- In 2009, Lebanon joined the International Renewable Energy Agency (IRENA)
- On an initiative of the current Minister for Energy and Water, Gebran Bassil, and after a lengthy debate, an electricity bill was passed September 22, 2011. It will give 1,2 billion USD to the Ministry of Energy and Water, in installments. It aims at providing an additional 700 MW energy output, which is needed in order to satisfy the national demand.

In addition, a regulatory board will be created.<sup>10</sup>

- *National Energy Efficiency Action Plan*: a policy plan for 2011-2015 that has been developed under the MED-EMIP project (initiated by EU) and the Regional Center for Renewable Energy and Energy Efficiency (RCREEE). It contains 14 measures to be taken in the realm of energy efficiency, energy conservation and renewable energies.

## Criticism from civil society:

- An encompassing strategy to implement effective policies is still missing.
- A constructive dialogue between all the actors involved such as ministries, parliamentary committees and civil society is lacking.
- Sanctions and better control are necessary in order to implement strategies successfully.
- There is little awareness and knowledge among the population for matters like renewable energy or energy conservation.
- High subsidies for fossil fuels make it hard for renewable energy producers to enter the market.
- Feasibility studies have to be carried out in order to explore the potentials in Lebanon.

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<sup>10</sup> The Daily Star Lebanon, September 22, 2011, "Lebanese Parliament passes \$1.2B electricity bill".

## Literature

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