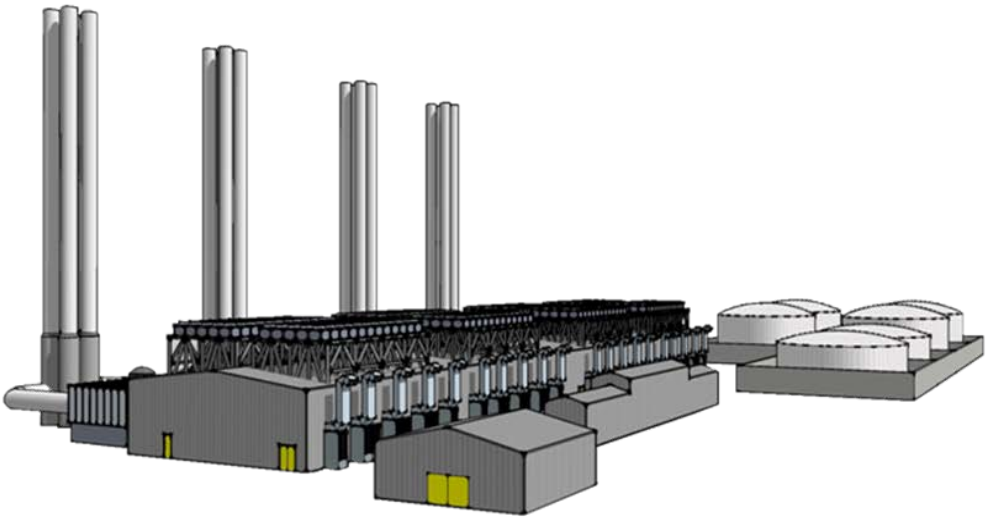
AES Baltic Holdings B.V.

Mitsui & Company Limited

AES Levant Holding BV Jordan PSC

IPP4 Al-Manakher Power Project



NON-TECHNICAL SUMMARY

August 2012

Introduction

AES Levant Holding BV Jordan PSC ("the Company") proposes to build a 250 megawatt (energy) power plant near Al-Manakher village, near the IPP1 Amman East power plant, which is owned and operated by AES Jordan PSC. The plant will use 16 large diesel engines that can burn heavy fuel oil, distillate fuel oil, or natural gas if that is available. The new plant is known as IPP4 (as the fourth Independent Power Plant in Jordan).

The purpose of the new plant is to supply electricity to Jordan's National Transmission System to help meet temporary demands ("peaking" demands) and to maintain the stability of the System. For example, if another plant is unexpectedly unable to supply power, IPP4 will be able to fill the gap. Power in the new plant is generated by engines, which can be operated alone or in combination with others, which will allow the Plant to respond quickly to changes in demand.

The potential impacts of the plant on people and the environment is evaluated in an Environmental Impact Assessment (EIA) under Jordanian law and under the requirements of the US-based Overseas Private Investment Corporation (OPIC) and the European Bank for Reconstruction and Development (EBRD). An EIA has been prepared by an international consultant, Parsons Brinckerhoff Ltd. and in association with Royal Scientific Society (RSS). The following documents are now being released – in English and in Arabic – for 60 days of public review and comment:

- A detailed EIA that has been reviewed by the Jordanian Ministry of Environment, OPIC, and EBRD. The document will first be released in English, with an Arabic version to be disclosed within the 60 day posting period . The Ministry will have to approve the EIA before the plant can be built.
- This "NonTechnical Summary" provides a short summary of the project in plain nontechnical language. It also describes the potentially important impacts it could have on people and the environment, and the actions the Company will take to reduce those impacts to acceptable levels.
- A "Stakeholder Engagement Plan" identifies the key stakeholders, including Jordanian regulators, describes how and where the Company will provide information to stakeholders, and how stakeholders can provide their views to the company via a grievance procedure.
- An "Environmental and Social Mitigation and Monitoring Plan" (ESMMP) describes in details what the Company will need to do in order to avoid, reduce, or control potential impacts to acceptable levels.

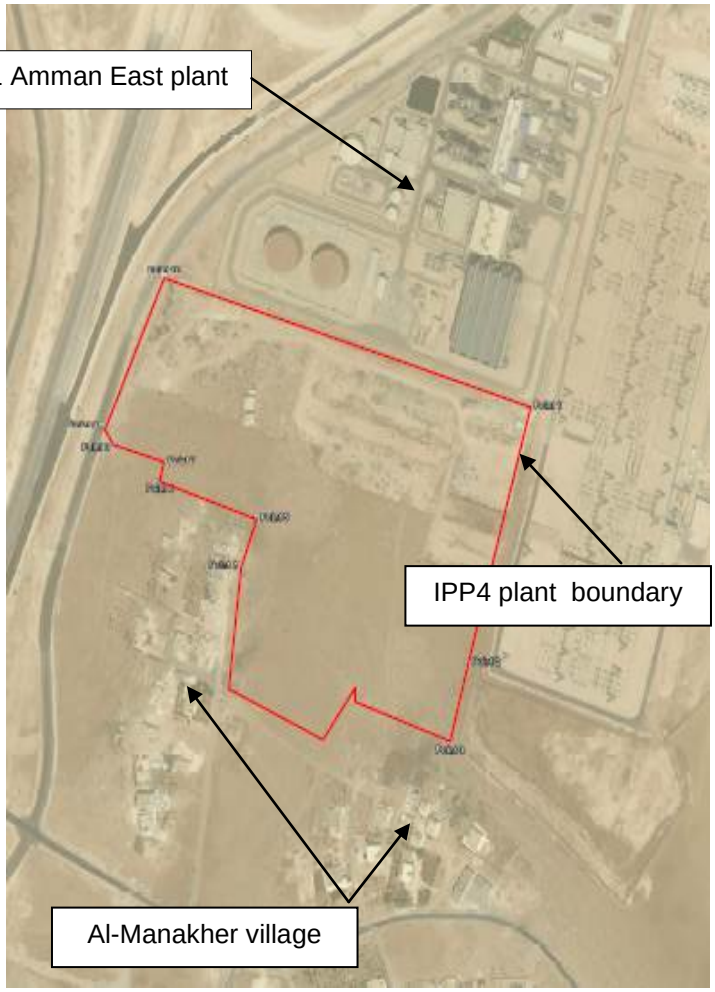
During the 60-day period consultation period, these documents will be available on the internet (EBRD Site) and copies will be available at the school in Al-Manakher village. Written comments are invited from all stakeholders, and should be brought or sent to the address given on the last page of this document. The Company will continue to hold meetings in Al-Manakher in order to present information on the IPP4 plant and to receive comments and other information from anyone who wishes to share their views. The date, time, and place of the meeting(s) will be announced a week in advance of the scheduled meeting. .

The following section of this document provide information about the new plant, describes the key impacts identified in the documents outlined above, and the actions the company will take to ensure these impacts are minimised (or positive impacts maximised).

Where will the new IPP4 plant be located?

The new IPP4 plant will be located about 14 kilometres east of Amman near the existing AES Amman East power plant, which is also known as IPP1. The land for both IPP1 and IPP4 is leased from the Ministry of Finance/Department of Lands and Survey and has been surrounded by a fence since the construction of IPP1 in 2007-2009. The new plant will lie on currently vacant land between IPP1 Amman East and the village of Al-Manakher, with the site boundary about 80-100 meters downhill from the nearest residence in the village and about 150 meters from the village school.

The location of the site is shown on the maps.



Who will own and operate the IPP4 plant?

AES Levant Holding BV Jordan PSC is incorporated in Jordan and has been set up with the sole purpose of building and operating the IPP4 plant. This company is owned by two other companies: AES Baltic Holdings B.V and Mitsui & Company Ltd.

IPP4 is not owned by the same company that operates the Amman East Plant (IPP1), though they do share the same major stakeholders. The two companies have separate management and will operate independently of one another.

Even though they are run by separate companies, the management of IPP1 Amman East and IPP4 where possible will work together to solve issues that may be related to both plants.

Why is the IPP4 plant needed?

Jordan depends almost entirely on fuel imported from other countries to meet its energy needs. In the past, it has met electricity demand with power plants fired by natural gas, and the only source of gas has been a pipeline from Egypt. As the country's economy develops, the demand for power is increasing but at the same time, security and quality of supply are decreasing. That means there is a particular need for fast-responding and flexible generating capacity to ensure the continued supply of electricity.

In the short term, the Jordanian government's efforts are focused on addressing these issues through the rapid construction of flexible generating capacity, which is capable of using a variety of fuels. At the same time, efforts are ongoing to ensure the country can access a wider range of fuel import options in the future.

In the medium term, the government has developed an energy strategy to ensure a stable, secure power supply; increase energy security; and reduce the environmental impacts of the power sector. The centrepiece of this strategy is an ambitious programme to generate 10 percent of Jordan's electricity from renewable energy sources by 2020. This requires installing 1,200MW of wind and 600MW of solar photovoltaic capacity. A tender to secure this capacity from private developers is underway. This renewable energy will not be available 24 hours per day, however, but only when wind is blowing or the sun is shining. For that reason, the country needs backup conventional capacity that is highly responsive and flexible.

The development of the new IPP4 plant will;

- Help address the current energy demands in Jordan
- Allow for fuel diversification and reduce the risk of power cuts due to interruption in gas supplies.
- Facilitate the future development of renewable energy, through strengthening the local grid and providing back-up power for future development of renewable energy in Jordan.

What does the project include?

The project will involve the construction of an engine hall to house the engines and electricity generators. This building will be about 150 metres long by 30 metres wide by 12 metres high. A number of other support facilities will also be constructed including warehouse, loading facilities, and an administration building. The construction process will take 17 months, and the after commissioning, will be operation for a period of approximately 30 years.

The power plant will have 16 compression ignition (diesel) engines that will be able to burn three kinds of fuel: heavy fuel oil, distillate fuel oil, and natural gas. The advantages of this kind of engine include:

- **Flexibility**: The engine can be run on either natural gas or on oil (heavy or light fuel oil) and can smoothly switch between fuels even while operating. They can provide the approximately the same relative output regardless of the fuel. This flexibility makes the plant, and thus Jordan's electricity supply, less vulnerable to interruptions in fuel supply and fuel price volatility.
- **Low emissions:** These engines operate on the lean-burn principle. This increases engine efficiency, reduces peak temperatures, and thereby also reduces NOx emissions.
- **Efficiency:** Both gas admission and pilot fuel injection are electronically controlled. The engine functions are controlled by an advanced automation system that allows optimal running conditions to be set, independent of the ambient conditions or fuel type.

The engines are made by Finnish company Wartsila , a world leader in engine production for the power and shipping industry, who have been chosen to provide engineering, procurement, and construction (EPC) services for the project.

The plant is similar to other recently commissioned plants around the world. The photo shows the same type of engines at the Humboldt Bay Power plant in Eureka, California, in the United States.

The diesel engines to be used by the new IPP4 plant are entirely different from the technology used at the IPP1 Amman East plant. IPP1 uses boilers to burn oil or gas, and the heat produces steam that drive turbines to generate electricity. The new IPP4's diesel engines will turn a shaft to generate electricity. The plants can use some of the same types of fuel, but they will be entirely different in terms of noise and air pollution. Exhaust gasses from the engines will be discharged into the air by four stacks (one for each four engines), each of which will be 70 meters high.

The new IPP4 plant will be able to use the existing gas pipeline, overhead transmission lines and electricity substation, which minimises the need to build new infrastructure.

What laws will apply to the plant?

Once the EIA is approved by the Jordanian Ministry of Environment, the project will be able to construct and operate the new plant, though the Company must implement all the mitigation measures and controls that are described in the EIA. Throughout the lifetime of the project, the Ministry may inspect the plant to verify the Company is obeying applicable Jordanian laws, including:

- Instruction for Hazardous Waste Management and Handling (2003);
- Civil Defence Law (No.35, 1999);
- Public Health Law (No. 47, 2008);
- Instruction for Management and Handling of Consumed Oil (2003).
- Management, Transport and Handling of Harmful and Hazardous Substances Regulations (No. 24, 2005).

In addition, the Company will have to meet additional requirements:

- Projects financed by OPIC have to meet World Bank / IFC's Performance Standards on Social and Environmental Sustainability. This includes IFC Environmental, Health and Safety Guidelines for Thermal Power Plants.
- Project financed by the EBRD have to be designed so they meet the Bank's Environmental and Social Performance Requirements as provided in the EMMP.

What are the potential environmental and social impacts of IPP4?

The EIA describes the potential impacts the plant could have on the environment (air pollution, water pollution, soil contamination and erosion, etc.) and on people (noise, interrupted views, increased traffic, economic benefits, etc.). The main potential impacts are described below.

Will the new plant pollute the air?

The main environmental impact from the IPP4 plant will be the emission of air pollutants, including nitrogen oxides (NOx), sulphur dioxide (SO2), dust/soot, and carbon monoxide and dioxide (CO and CO2). Air quality around the new plant now meets Jordanian standards, and the new plant will comply with applicable standards.

In preparing the EIA, computer models were used to estimate air quality as a result of emissions from the new plant, and in combination with emissions from the existing IPP1 plant. These models showed that concentrations of air pollutants will be within Jordanian standards and thus will not have an effect on health. Specifically:

- The predicted maximum process contribution to short term NO_2 concentration is 159.3 micrograms per cubic meter ($\mu g/m^3$) and is within the short-term limit of 200 $\mu g/m^3$.
- The predicted maximum increase to short-term PM_{10} (very fine dust that can be inhaled into the lungs) concentration is 7.8 $\mu g/m^3$ and is well within the prescribed limit for a 24-hour averaging period.
- The predicted maximum increases to short-term SO_2 concentrations is 90.9 $\mu g/m^3$ and within the prescribed limit for a 24-hour averaging period.
- The predicted maximum concentrations of CO, TSPs, H_2S and hydrocarbons are negligible.

The Company will use several measures to control air pollution, including:

- Burning only high quality fuel oil with low sulphur (less than one percent) and low ash content, which will be monitored under the project's environmental management system
- Using high efficiency Selective Catalytic Reduction (SCR) for the removal of nitrogen oxide air pollutants (NOx). The use of SCR is considered Best Available Techniques under the European Union's reference document for Large Combustion Plants.
- Monitoring emissions of NOx, SO2, CO, and dust continuously to verify that emissions of all these pollutants are within acceptable limits.
- Monitoring of air quality near Al-Manakher village on a regular basis and taking necessary steps to minimise to ensure limits are with those stipulated in the Environmental Statement.. An annual report shall be produced annual which is available on request.

Within the first two years of IPP4 plant operation, the Company will conduct a comprehensive review to verify that pollutant emissions from IPP4 are within acceptable limits and that air quality also meets standards to protect human health.

Will the new plant affect water or soil?

The EIA study has confirmed that the project will not have a significant impact on local water use or on water quality. Groundwater will not be taken from on-site bore holes or local wells and the plant will not impact on the water resource or water quality of the local community. Instead, all water needed for the Project will be provided by the Water Authority of Jordan (WAJ) and Miyahuna through a terminal point at the site boundary which is connected upstream to the same pipeline providing water to IPP1.

The plant will use up to about 240 cubic meters of water per day, which will be used in the exhaust gas boiler and the SCR system. The water will be need to be purified before being used and effluent from the water treatment process will contain salts removed from the raw water, and also some additional sodium sulphate produced by neutralisation of the spent regenerants. This effluent will discharge to an on-site collection pond.

SCR effluent will be treated and reused, with any residues managed according to international best practices and Jordanian law. During commissioning and occasionally during the life of the plant it will be necessary to chemically clean the water side of the boiler tubes. All effluents will be tankered off-site by a licensed contractor for treatment and disposal at an appropriately licensed disposal facility.

During maintenance it may be necessary to drain down the exhaust gas boiler, the closed circuit cooling water system or parts of these systems. There are two exhaust gas boilers (7 bar each) which will not be taken out of service simultaneously. All wastewater from this process will be discharged to the collection pond after treatment this quantity is only small given the size of the boiler.The cooling water will be high purity water containing only small amounts of corrosion inhibitor. All other maintenance waters will be discharged to the maintenance tank and returned after maintenance has been completed.

The plant will be designed to prevent any spills or releases of oils or chemicals that could contaminate water or soil. All oil and chemical storage tanks and areas where drums are stored will be surrounded by an impermeable wall called a bund, that can contain at least 110 percent of the contents of the largest tank. Permanently fixed taps, filler pipes, pumping equipment, vents and sight glasses will also be located within the bunded area. Taps and valves will be designed to discharge downwards and will be shut and locked in that position. Manually started electrically operated pumps will remove surface water collected within the bund and its composition will be verified prior to disposal. Daily visual inspection of bunded areas will be made to ensure the effectiveness of these systems.

Any waste oils that cannot be recovered, recycled, or reused will be removed by a license contractor and disposed of at an appropriate disposal site.

The plant will be designed taking into consideration the danger of flash floods. This may include such measures as construction of a diversion channel or raised barrier (called a berm) surrounding the plant facilities.

Emergency response plans will be developed for the leaking of any hazardous substances stored/used on-site.

Will the new plant be noisy?

Computer models demonstrate that noise from the IPP4 plant by itself will be within the limits set by Jordanian law and international standards. It will add between 0.2-1 decibels (depending on the location) to the existing noise level, which should not be heard because noise changes of less than 1 decibel are not perceptible by humans. Studies indicate that background noise levels at sensitive locations in Al Manakher village are above the required noise limits. Additionally there are concerns at the village regarding impact from noise. New noise studies are being carried out to identify noise from existing plant and to analyse current impact.

The company that owns IPP1 is currently reviewing the situation to identify how noise can be better controlled. In the future, IPP1 and IPP4 will, where possible, work together to ensure that noise levels from the two plants meet applicable standards.

To ensure the new IPP4 plant noise impact is minimal, the Company will implement the following measures:

- A computer model of the proposed plant items will be produced at the detailed design stage to calculate the predicted noise levels at sensitive locations in Al-Manakher village and at the plant boundary.
- Detailed design will use site layout and orientation to reduce noise that could be heard in the village.
- Since tonal or impulsive noises are considered more annoying than continuous noise sources, plant items will be silenced or otherwise controlled through regular maintenance to ensure no such emissions are audible at sensitive locations.
- Inherently quiet plant items will be selected wherever practicable. High performance silencers will be fitted to achieve maximum noise attenuation on plant and ductwork. Acoustic lagging and low noise trims will be fitted to all pipe-work and noise generating valves.
- High performance acoustic enclosures will be considered for all plant items where practicable, including smaller plant items such as compressors and pumps.
- Internal surfaces within the engine enclosures will be treated to control internal reverberant noise levels. An appropriate treatment could include placing dense mineral wool panel behind perforated sheet steel, or a spray-on cellulose fibre treatment.
- Plant items that are used for periods of shorter duration such as at engine start-up and shut down will be afforded the same level of noise control as all other plant.
- To the extent possible, noisy plant will be positioned such that it faces towards the existing plant or towards the new plant such that all sensitive receptors benefit from screening and/or directivity corrections.

In addition, the Company will monitor noise levels upon receipt of any reasonable request by a person or village representative who may be exposed to noise from the plant(s). Should

unacceptable levels of noise be detected, based either on measured levels or perceived disturbance, the Company will work with the affected party to identify and resolve the noise emissions to those stipulated in the Environmental Statement.

Will there be an increase in traffic?

Up to 1,000 workers may work at the site during construction, although 600-700 would be more common. This can be accommodated on existing roads and no new roads will be constructed as a result of the project. Contractors will be encouraged to provide minivans or other transport for workers but there still could be up to 200 staff vehicles travelling to and from the site each day. In addition, about 10 light vehicles and 100 heavy vehicles per day will bring materials and equipment to the site. The majority of the engines structures will be precast modules minimising the number of vehicles to deliver equipment. .

The Company will prepare and implement a Traffic Management Plan that sets the rules for all vehicles. This Plan will prohibit vehicles from passing directly through Al-Manakher village. Signs will be posted on roads to alert other drivers of the ongoing construction traffic and other hazards. The Company will also monitor traffic and if bottlenecks or other problems are found, the Traffic Management Plan will be revised to avoid or reduce the problems.

There will be much less traffic during operation. Up to 10-14 tanker trucks per day will bring fuel oil from Aqaba to the site, and they will avoid morning and evening rush hour periods.

Will there be benefits to the community?

There will be some opportunities for temporary employment during construction. The number of local people who may be employed is not known, but the Company will encourage contractors to hire local workers who have suitable skills. Possible opportunities could include such jobs on-site labour, security guards, or drivers subject to skills and adherence to site safety rules.

During operation, the Company will also consider local people for permanent and temporary positions. Most or all permanent positions will require specialised skills, however, so the number of positions is likely to be less than during construction. Companies that provide security and other services would be encouraged to hire local workers, as has been the case at the existing IPP1 Amman East plant.

AES Jordan PSC, which owns and operates IPP1 Amman East plant, is committed to working with their local stakeholders, and has previously made a number of contributions to the community, including renovations of the village cemetery and support to the village school. They cannot directly provide electricity but will contribute toward solar water heaters and in the future may provide solar voltaic panels to generate electricity at village houses. It is expected where possible that the two companies will work together to continue to support the community in various ways.

Environmental and Social Mitigation and Monitoring Plan (EMMP)

A comprehensive Environmental and Social Management and Monitoring Plan (EMMP) has been developed for the Project and is being disclosed as part of the EIA package. This Plan included actions that the Company must take in order to meet the requirements of Jordanian law, World Bank/IFC Guidelines, the EBRD's Environmental, Social and Performance Requirements as presented in the EMMP.. The Plan includes the measures described in this NonTechnical Summary to avoid or reduce impacts on people and the environment, and many other measures to help reduce or avoid even minor impacts.

To ensure that the monitoring and mitigation measures outlined in the EMMP are successfully implemented, the Company will appoint an environmental, health and safety, and social manager during the construction and operational phases. In addition, the Company will also develop, implement and attain independent certification to an Environmental, Health and Safety Management Systems such as; ISO 14001and OHSAS 18001.

Additional information and grievance procedure

As was described on the first page, the Company is seeking comments on the ESIA package for the IPP4 project , which need to be submitted by 19 October.

Further information can be found by contacting:

Mr. Feras Mohammad Hammad,
Acting Stakeholder Liaison Officer for IPP4

Location: Amman East Power Plant
Al Madhonna St – Al Mankher Village
P.O. Box 3099
Amman 11181

Telephone: 6 4293200
Mobile: 79 6401352
E-mail address: feras.hammad@aes.com

Or

Ms. Susan Khadra
Personal Assistant
Telephone: 6 4293200
E-mail address: susan.khadra@aes.com