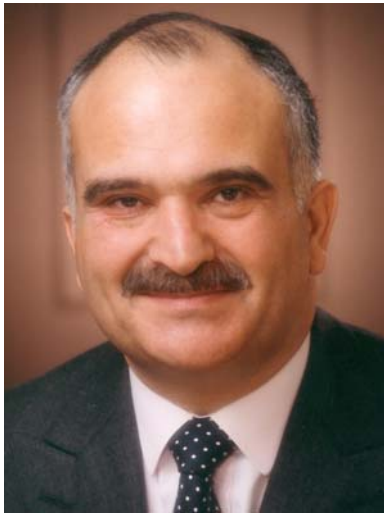


# Energy, Water, Environment: Common Challenges Facing The Region

By His Royal Highness Prince El Hassan bin Talal of Jordan



THE HIGHER COUNCIL FOR  
SCIENCE AND TECHNOLOGY



TREC

Clean Power from Deserts  
Trans-Mediterranean  
Renewable Energy Cooperation  
An Initiative of The Club of Rome

President of the Jordanian  
**Higher Council for Science and Technology**  
and of **The Club of Rome**.

*The following is an official English translation of a speech delivered by Prince Hassan bin Talal at the opening ceremony for the 12<sup>th</sup> Annual Science Week, organized by the Higher Council for Science and Technology, in Amman on 27 November.*

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<http://www.mees.com/postedarticles/oped/v49n52-5OD01.htm>

## **Energy, Water, Environment: Common Challenges Facing The Region** **By His Royal Highness Prince El Hassan bin Talal of Jordan**

I would like to address the theme of Science Week in the most urgent terms and emphasize my belief that energy, water and the human environment are supranational issues which must be dealt with as common challenges for our greater region.

I have long called for a regional approach to the worsening situation of our peoples in West Asia/North Africa. After four decades of engagement and dialogue with political and religious representatives, I am greatly concerned that the populations of our region have been deprived of their human character and forced to occupy a desolate middle ground between polar fanaticisms. Only by moving away from short-term, bilateral policy-making and by championing foreign and economic relations without impunity can we ensure a more inclusive future for all.

In this regard, the two natural and connected resources of energy and water are vital to the lives and livelihoods of our citizens. Their interplay creates wealth for some, while development and progress is dictated by their management. In addition, employment opportunities are governed by their availability. Indeed, we have seen much coverage recently of the so-called thirsty states, Jordan being near the top of that list. But this thirst should be viewed beyond water or energy. These are factors in a thirst for greater inclusiveness, particularly for the poor in our society.

I firmly believe that dialogue and negotiation, mutual respect and concrete investment in the human capital of our region may yet stem a threatening tide of events. To avoid social and climatic disaster, we must address that credibility gap which has grown between government and people, and between East and West, as basic needs and fears of peoples and of states are ignored by leaders.

### **Oil States/Non-Oil States Cooperation**

We must encourage all parties in our region to come to the table so that a stability pact, with guarantees and responsibilities for all, may be forged through disagreement and discussion. Such diplomatic multilateralism in the Middle East must be supported by a greater economic initiative involving oil and non oil-producing states. Indeed, the people of the Middle East are in dire need of a cohesion fund to build a framework for hope and prosperity. Some 50 years ago, the Marshall Plan for peace-building ensured that Europe was rebuilt after decades of bloody internecine conflict. Today, the people of our region need a similar investment of funds and of confidence. It is imperative that the economy of oil and arms which has brought degradation to our human environment becomes nothing more than a dark chapter in the long history of the Middle East.

Knowledge is not a panacea for everything but science must serve our burgeoning needs as the anticipated population growth in the Middle East faces us with ever-greater challenges. The population of this region is estimated to rise from 400mn in the year 2000 to 720mn in 2050. Indeed, the world's population is increasing at the rate of a quarter of a million every day. Thus, we face four challenges: a scarcity of energy, a scarcity of water, severe climate change and the need to dispose of waste, particularly hazardous waste. The importance of a supranational approach to these grave challenges must be acknowledged by leaders if we are to avert disaster.

In his recent book, Al Gore referred to the inconvenient truth of climatic change. Indeed, as far back as 1972, the Club of Rome warned us of the limits of growth for our planet. I am honored to be president of this organisation which bravely continues to address the fact that within three decades we will face real and grave challenges to our existence. The world today consumes the equivalent of 8bn tons of oil annually, a figure that is expected to reach 40bn tons by 2060. Meanwhile, experts anticipate that the cost of electricity will increase by 160% worldwide. To put this into context for the developing world, the total assistance given to Africa and the writing off of regional debts will account for just a small portion of the cost of electricity for a thirsty world.

Increasing use of fossil fuels will have a dire affect on the world's cities. Of course, I do not include London or New York in this stark warning. The rich will inevitably harness science to provide solutions to new problems. But those millions forced to leave Peking, Shanghai or Calcutta will not benefit from such a safety net. Indeed, will science be used to help the vulnerable of Bangladesh? It is predicted that some 60mn people will lose their homes there in the near future, in a country which loses two-thirds of its land to water during every rainy season. Where is the covenant or strategy for energy and environment for these silenced populations?

### **Technology/Leaders' Will**

But there is hope, if technology is combined with the will of leaders to make global changes for the better. In the German context, alternative energy has generated around 177,000 work opportunities directly or indirectly, while revenues have reached approximately 12bn euros per year.

During my speech at the UNESCO Peace Clock award ceremony in Berlin in November, I addressed the need for future energy policies which consider the needs of all, including those less privileged in the world. Within this context I highlighted TREC, the Club of Rome's initiative for a **Trans-Mediterranean Renewable Energy Cooperation (TREC)** between the sun and the technology belt, and of the German DLR for the advancement of Concentrated Solar Thermal Power (CSP) and for its application in the West Asia and North Africa (WANA) region. In my capacity as President, please allow me to discuss with you the details of the initiative, which I hope will lead to a long-term partnership between Germany, the EU and the WANA region.

Present efforts for climate stability are far behind those forces and activities which push towards even faster climate change. Climate and energy security are a global necessity. However, they should be seen as the most important items of national, regional and global security.

Let me share with you my vision of how we can tackle this difficult mission: Some 40 years ago, the Apollo Space Program was launched to bring man into outer space. I propose, that we now stage an effort with similar determination and ambition bringing humankind back into balance with mother-nature, by employing European technologies to tap into the solar energy of the WANA deserts at large scale, and thus bring the deserts of the world into service for global climate, energy and water security. In other words: to launch an Apollo DESERT Programme as an effort of the EU-WANA region.

Sir George Porter once said: "I have no doubt that we will be successful in harnessing the sun's energy... If sunbeams were weapons of war, we would have had solar energy centuries ago."

### **Clean Power From Deserts**

As the deserts receive thousands of times more energy from the sun than we require, the mounting energy and water supply problems in Europe and WANA could be resolved with clean power from the deserts. Indeed, detailed studies financed by Germany's environment ministry in the last three years suggest a roadmap to this end:

Firstly, we must organise a large scale deployment of solar thermal power plants in deserts and, particularly, their coastal regions. We must follow this with the construction of an interconnecting south-north grid as a lifeline for our sustainable EU-WANA energy future. Such an effort could also breathe new life into the Barcelona Process, as well as becoming an important component in creating regional stability.

## **Gaza/Sana'a Water And Power**

And how could a large-scale installation of solar power plants be initiated in desert regions? Let me suggest a possible plan of action. Based on the work of TREC, I would like to propose two well defined projects as a gateway for development:

The first is a solar water and power source for Gaza. This would comprise solar energy-based sea-water desalination and power plants for 2-3mn people, located at suitable places in the nearby Egyptian Sinai coastal region, and with corresponding water and power-lines into the Gaza strip. This should be built as part of an international recovery programme for Gaza.

The second project is a solar water source for Sana'a. According to the Sana'a authorities, the Yemeni capital is facing, within the next 15 years, the expiration of its ground water reserves, with the implication of forced evacuation of this world cultural heritage site. Solar energy-based desalination and power plants could be built near the Red Sea to cogenerate fresh water for Sana'a and power for pumping it through pipelines up to this region with 2-3mn inhabitants.

These two projects would establish permanent and timely solutions for the supply of power and water to the two respective regions in crisis. They are technically feasible but require financial and political support. By carrying out these two projects the technology of solar steam generators would be matured to a point when it would undercut the cost of most fossil fuels. Such low-cost solar-steam generators would allow us to reinvent desert space all over the world as solar power-houses and, in the vicinity of coasts, into inexhaustible desalination facilitators.

Together with the South-North grid initiative, the Gaza and the Sana'a projects could become key-projects for a Copernican revolution towards balance and sustainability. The world is in dire need of creative, achievable initiatives towards energy, water and climate security. Here is our opportunity. Germany has always held a strong presence within the EU, and with the up-coming EU Presidency, Germany can take this opportunity to enhance and strengthen the EU-WANA partnership.

**I invite you all to look at our deserts in a new light, as an inexhaustible source of clean energy and fresh water.** I challenge you to put technology (the work of man) and deserts (the work of God), to the service of mankind and nature. Billions of people, animals and plant species would benefit from a stabilised climate. I challenge European political and industry leaders to take action and make this vision a reality.

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**The best solar power technology** for providing secure capacity is solar thermal power plants (also called **Concentrating Solar Thermal Power, CSP**). They use mirrors to concentrate sunlight to raise steam and generate electricity. Excess heat from additional collectors can be stored in tanks of molten salt and then be used **to power the steam turbines during the night**, or when there is a peak in demand. In order to ensure uninterrupted service during overcast periods or bad weather, the turbines can also be powered by oil, natural gas or biomass fuels. An interesting by-product that can be a great benefit to the local population is that waste heat from the power-generation process can be used to **desalinate seawater** and to **generate thermal cooling**. Since photovoltaics do not allow for solar energy storage they will not play a significant role in desert regions.

With the technology of **High Voltage Direct Current (HVDC)** power, transmission losses can be limited to only about 3% per 1000 km. The better solar radiation in North Africa outweighs by far the **transmission losses across the Mediterranean of 10-15% to Europe**. Although hydrogen has in the past been proposed as an energy vector, this form of transmission is very much less efficient than HVDC transmission lines.

**Further information** about the concept of **Clean Power from Deserts** and the **Trans-Mediterranean Renewable Energy Cooperation (TREC)**:  
<http://www.TREC-EUMENA.net>