ESMAP Application Form

ESMAP seeks to provide intellectual leadership on energy-related issues to client countries as well as the development community at large. To ensure the sustainability of its work, ESMAP maintains a sharp focus on building local capacity in client countries. Therefore, ESMAP's welcomes activities that not only generate new knowledge but are also designed to involve the client institution(s) and stakeholders such that their own capacities to continue the work are enhanced.

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Project Title: Workshop on Design and Implementation of Time of Use Pricing and Demand Management Mechanisms

Region/Country: Egypt

Task Manager: Eric Groom

Implementation Partner (if applicable): Egyptian Electricity Holding Company (EEHC)

Expected Dates for Start: 1 August 2005

Expected Dates for Completion: Mid-November 2005

ESMAP Strategic Areas:

Energy Poverty	Y
Energy Environment	Y
Market Development	

Stakeholder Engagement:

	Yes	No	Date Expected
Client Official Endorsement			
Country Director Approval			

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A brief summary of the project: (Max. 250 words)

The project's primary objective is to assist the EEHC design and implement time-of-use (T-O-U) pricing and demand management (DM) mechanisms by providing practical advice on the structuring and implementation of these programs by other utilities. Targeting a component of the work on energy efficiency for households (especially the poorest households) will also assist in addressing the subsidization of household tariffs by managing the impacts on the poor.

It is proposed to hold a workshop in Cairo that will bring together experts that have been deeply involved in the design and implementation of time-of-use energy pricing and demand management mechanisms by utilities. The workshop will focus on lessons for best practice design of these programs and demonstrate the impacts of these programs. This will help the EEHC design T-O-U and demand management programs and estimate the impacts of these programs and provide the EEHC with evidence and international experience of how these impacts can be factored into investment planning.

In order to maximize the value of the workshop senior representatives from other electricity utilities in the region may also be invited to attend. A report of the workshop proceedings will be produced to ensure the results are more broadly disseminated for possible application in other countries. The feasibility of further disseminating the material through a course or other training material will be assessed in collaboration with the WBI.

I. Context

(Max. 350 words)

Issues and global context

While the potential benefits of T-O-U pricing have long been recognized, its application is growing and new, more innovative approaches are being developed. Similarly new more market-oriented approaches to DM – often building upon stronger price signals - are being developed. These developments have had less impact in countries in the energy rich countries, such as Egypt, where retail electricity prices are very low and often heavily subsidized. However, even if the fuel costs are low the capital costs of meeting rising peak loads are substantial, and the subsidization of retail prices promotes inefficient consumption and provides an opportunity to structure DM programs that are both economically and financially viable. Hence, Egypt provides an important opportunity to demonstrate the potential role for T-O-U pricing and demand management in energy rich countries.

Local context and issues

The EEHC plans to increase capacity by 13000 MW (over 2/3 of current capacity) over the period from 2002 to 2012. This reflects a decline in reserve margins and a forecast growth in demand of about 7% p.a.

Average retail prices are well below the conservative estimates of the economic cost of new generation capacity (3.5c/kWh) or import parity costs for energy (3.8 c/kWh). While the EEHC benefits from subsidised financing and gas costs (relative to export parity prices), the investment in additional capacity at these retail prices would put further financial pressure on the EEHC. In the short term this pressure is being offset by increases in the average retail price of 8% in 2004 and 5% pa for the following 5 years. Despite this, prices will remain below the economic costs of new capacity. Furthermore, low average prices and the lack of signals of the true cost of meeting peak demand requirements encourage further, possibly inefficient, growth in demand. Demand growth has been strongest in the residential sector where prices are particularly low relative to costs. Casual observation suggests that a significant factor behind this growth in the air conditioning load with the proliferation of 'window-box' airconditioners.

Addressing these issues is likely to require higher average prices (especially in the customer classes with the lowest level of cost recovery like residential customers) and more innovative forms of T-O-U tariffs.
These price options can take many forms:

- A simple peak/shoulder/off-peak price structure, possibly with seasonal premiums
- Prices that include a maximum demand charge
- Peak pricing where, with prior warning, the price may be many multiples of the average price during periods of maximum system demand
- 'Negative prices' where the utility 'buys' verifiable reductions in demand

The EEHC has an Energy Efficiency Improvement and Greenhouse gas reduction program under way. The program commenced in 1999 with funding of $5.9m over 4.5 years and collected data on consumption patterns and developed implemented demonstration programs such as commercial energy efficiency programs. The Ministry of Energy and Electricity has expressed its full commitment to the objectives of this project which is targeting energy savings equivalent to 11.8% of energy consumption[1]. The EEHC is also installing 3000 meters at the sites of the largest users that can provide load information necessary for the design of the pricing and DM programs. The proposal will build upon these initiatives. However, further analysis of patterns of energy use will be required to ensure optimum design and targeting of more sophisticated pricing regimes. This would be a component of possible follow-up implementation projects for which further funding may be requested. Additional investment in metering may also be required.

The current under-pricing of electricity suggests there may be scope for energy efficiency programs that are more efficient than supply-side options – particularly the residential sector where the level of subsidy is estimated to be very high. Furthermore well-targeted energy efficiency programs can offset the impacts of increases in unit prices on affordability of energy and industrial competitiveness.

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[1] Dr I Yassin, "Promotion of Efficient Lighting within the Energy Efficiency Improvement and greenhouse reduction Project Activities" *Electricity and Energy*, February 2005, p10.

Finally, T-O-U tariff signals and the progressive increases in electricity tariffs is an important first step in encouraging more sophisticated energy efficiency strategies and activities, and stimulating the development of Energy Services Companies (ESCOs) market. However, further analysis of the conditions for an active, commercial energy efficiency service could be a component of follow-up projects.

Consistency with ESMAP business plan

The primary goal to reduce peak loads can be achieved through both peak shifting and energy efficiency. Hence, T-O-U pricing and DM mechanisms would encourage greater energy efficiency with reductions in environmental impacts. These mechanisms can help protect the affordability of energy for households directly through well-targeted metering and energy efficiency programs and indirectly through better utilization for supply-side assets and reduced capital expenditure requirements.

II. Objectives and Activities

(Max. 800 words)

Objective	Activities	Deliverable	Impact indicators
Implementation of T-O-U pricing and DM mechanisms to in order to improve asset utilisation, reduce costs and improve environmental outcomes	Workshop on practical issues in designing and implementing T-O-U pricing and DM in Egypt	Workshop	1) Subsequent introduction of T-O-U tariffs and DM mechanisms 2) Impact of mechanisms on growth in maximum load and energy consumption
Implementation of household energy efficiency programs to reduce the impact of rising unit prices on affordability of energy services	Inclusion in the workshop of a session on the design of energy efficiency programs targeted at residential customers	As above	1) Referencing of workshop in the development of household energy efficiency mechanisms 2) Impact of energy efficiency programs on growth in household energy consumption
Encouragement of T-O-U pricing and efficient DM mechanisms in other countries	Preparation and dissemination of proceedings of the workshop. Guidance note for staff on T-O-U pricing	Proceedings of the Workshop	1) Circulation of paper on proceedings 2) Referencing of the workshop in the development of similar initiatives in other countries 3) Referencing of the guidance note in external and internal projects/publications

III. Implementation Arrangement (Max. 500 words)

Activities	Timeline	Responsibilities
Develop program for workshop	30 June	WB
Contract speakers,	29 July	WB
Invite attendees, organize venue and function	End September	EEHC/WB
Prepare and disseminate proceedings of workshop	Mid-November	WB

The World Bank's contribution will be in-kind and will cover staff-time and costs of organising the program, contracting the speakers, and preparing and disseminating the proceedings of the workshop.

IV. Sustainability & Risks (Max. 350 words)

Financial sustainability

The workshop and publication will be fully funded by the requested ESMAP funding and the proposed contribution from the Bank.

If the EEHC proceeds to implement an efficient T-O-U pricing and DM program it will help improve its financial position by deferring investment in new capacity and helping the EEHC lift the overall level of cost recovery.

Institutional Sustainability

Organization of the workshop and dissemination of the proceedings is a stand-alone project that does not require ongoing institutional support.

The existing institutions (EEHC and Egypt Electric Utility and Consumer Protection Regulatory Agency (EEUCPRA)) provide a sound institutional basis for the implementation of T-O-U pricing. The EEHC has been under financial stress but it has a very high reputation for its technical and engineering capacity and has already established an internal pool that can provide important T-O-U signals at a wholesale level. Similarly, while the EEUCPRA is a relatively new organization and does not have formal price-setting powers it has already developed strong analytical and policy capacities.

Potential replicability

The position in Egypt is typical of that in a number of other countries in the region, and elsewhere, especially among countries with an abundance of energy resources. Hence, the project should provide valuable lessons for implementing programs in other countries facing similar circumstances, i.e. low, subsidized prices that encourage inefficient demand growth and place stress on the financial and physical capacity of the utility to meet this growing demand. The synergies with other countries in the region will be maximised by inviting representatives of some of the other utilities in the region to the workshop and working with Dr El Sobki of the EEHCPRA to disseminate the results of the workshop through the recently established forum for regulators in the Arab League. The project will also be integrated with the Banks other activities in energy efficiency and the climate agenda.

Major risks

The project entails relatively few risks. Its costs are quite small relative to its potential impacts. It will build upon other ESMAP part-funded work (the primer on DM and associated paper on dynamic (ie T-O-U pricing) and increase the dissemination and effectiveness of that work. In turn the progress already achieved by that project will provide a sound basis for establishing the framework and the selecting the case studies for the workshop.

The primary risk is that the workshop does not lead to implementation of T-O-U tariffs and efficient DM mechanisms by the EEHC. The EEHC has shown a commitment to introducing T-O-U pricing by installing 3000 T-O-U meters and collecting load data. Given this and the substantial financial and resource pressures faced by EEHC in meeting the expected growth, it is considered highly likely that the EEHC will commit to T-O-U and DM initiatives.

V. Team Composition from the World Bank

(Max. 100 words)

The project manager will be Eric Groom, Senior Regulatory Specialist in Infrastructure Advisory Services electricity reforms, with support from Sophie Jablonski on the design of energy efficiency and demand management components. Eric has had extensive involvement in electricity pricing and demand management and renewable energy policy development. Sophie is an environmental engineer who has worked on the design and implementation of several energy efficiency initiatives for the industrial and domestic sectors in the Middle East, North Africa and Europe. Luiz Maurer will provide advice on the program and potential speakers and will be an expert speaker at the workshop.

VI. Additional Comments

Indicative Program for the Workshop

Introduction – World-wide trends in T-O-U pricing and DM

(This session will provide and overview of developments in the field)

Ahmad Faruqui CRA Lead Consultant

Developments in Demand Management and Pricing in Egypt

(This session would provide information on energy use patterns and emerging trends, outline the current programs and indicate options for consideration)

EEHC

Case Study in development and application of T-O-U pricing

(This will be a hands-on a worked-example which looks at the process for developing T-O-U pricing – the information required on utility costs and customer demand profiles, the metering and IT requirements, the estimation of the impact of the program and the ex-post audit and verification)

EDF (with Ahmad Faruqui?)

Lunch Break

Applications of T-O-U pricing in Commercial Industrial Sectors

(This will report on the design and implementation of T-O-U schemes in developing countries and their effects.

Turkey/Tunisia/Saudi Arabia/Mexico

DM and Energy efficiency mechanisms

(This will look at the design of institutional arrangements and policy instruments to encourage energy efficiency, the estimation of the potential for energy efficiency and the design of energy efficiency programs)

Italy

Residential Energy Efficiency programs

(This will look at the design of pricing and energy efficiency programs for the residential sector in particular and the impacts such programs have had on residential use of energy)

Luiz Maurer WB

Concluding Comments