New Professional Masters Program: Master of Energy Economics

A graduate education program facilitated by the Rice Initiative for the Study of Economics (RISE), the Rice University School of Social Sciences, and the Center for Energy Studies at Rice University’s Baker Institute

I. Introduction

The new professional masters degree program Master of Energy Economics (MEECON) will offer students graduate level education that emphasizes applying economic principles to analyze and understand commercial and other influences on energy markets and effectively communicate their insights. The degree program provides students with a deep set of analytical skills along with practical knowledge of energy markets. It offers practical training for energy markets analysts working in government, the private sector, and international organizations. MEECON graduates will help companies and governments position themselves to deal with the uncertainties that are pervasive in the energy sector.

To meet these challenges, the MEECON offers a unique educational experience in a 12-month, 40-credit-hour degree program. The curriculum is offered in four terms, with an internship in the final term.

II. Rationale

Energy is necessary for continued economic activity in modern industrialized nations, and its absence would result in economic decline and rapidly diminishing standards of living. A lack of modern energy services is a principal cause of low levels of economic and social development in developing nations. Electricity is critical to increasing educational attainments and providing modern health care. The replacement of manpower and animal power with mechanical power through the development of new technologies has been critical for enabling productivity growth and the associated unprecedented economic growth and radical improvements in standards of living over the last two centuries. One example is the invention of the internal combustion engine, which along with the consumption of crude oil products, has provided a more expedient means of transporting people and goods thus creating growth opportunities by connecting markets and facilitating trade. It is for these reasons that governments concern themselves with policies aimed at ensuring access to energy services at reasonable prices.

At the core of any discussion of these matters is the manner in which energy markets function. The inexorable link between economic activity and energy demand implies that understanding the sources of growth is critical to determining the market pull for energy resources. The economic factors that determine supply and deliverability then determine how the demand for energy services will be met. More specifically, the economics of energy supply and deliverability affect how energy resources are allocated through both space and time.

Generally, energy resources are classified as either depletable or non-depletable. A resource is considered depletable – such as crude oil, coal and natural gas – when the sum over time of all possible production is finite, or the stock of the resources is not
replaceable in a reasonable time frame. By contrast, non-depletable, or renewable, energy resources – biofuels, geothermal, wind, and solar – can be replenished within a reasonable time frame. Much of the discussion about energy policy centers on the rationale for, and means of, creating economic conditions that favor investments in particular sources of energy supply. In addition to policies, technological innovations also can transform market paradigms, rendering old infrastructure obsolete while facilitating new investments. Affected capital is not only found in energy conversion industries, such as electricity generation, but also in energy distribution infrastructure, such as pipelines and transmission lines, and some energy-using capital. Hence, it is important to understand the inter-relationships of energy choice, capital investment and return to invested capital, plant and facility operations, and market performance in order to fully appreciate the manner in which policy actions or technological change will affect outcomes.

Rice is uniquely positioned to offer a very successful professional masters degree Master of Energy Economics program. Rice is situated in Houston, the widely recognized energy capital of the world, and has an existing reputation in energy studies built upon the programs in the Economics Department and the Baker Institute’s Center for Energy Studies (CES). The Economics Department has an existing field of study for its Ph.D. students in energy economics, which consistently places students at high levels of industry, government and academia. The CES was ranked fifth globally among all energy and natural resource think-tanks in 2013, and its reputation is built on the economic modeling and data-driven analysis of various political and geopolitical market stresses. Faculty in the Economics Department and the CES have worked very closely together for years and hold leadership positions in field-specific professional organizations such as the International Association for Energy Economics. These types of engagements allow the MEECON program to leverage existing faculty expertise and tie into deep networks of visiting faculty. Moreover, the reputation of the faculty engaged in the energy field at Rice will attract high quality students who have a strong predisposition to expand their capabilities in the field.

Importantly, the MEECON program will enhance the reputation of Rice University as a leader in energy economics education. Already well-known in the energy industry for its energy economics education at the undergraduate and doctoral levels, the MEECON has established a new medium for dissemination of energy economics education to energy professionals. This will be specifically valuable to providing human capital development to professionals in business development and/or strategic planning roles in their respective corporations. Moreover, the MEECON program is unique among universities around the country.

None of the existing masters programs addressing energy economics are in Houston, and none are like the MEECON program proposed herein. All other programs are two years in duration and most focus on Resources Economics and/or Environmental Economics – Harvard University, University of Rhode Island, University of New Hampshire, Michigan State University, Portland State University, Duke University, California State University, to name a few – with only a few having a focus specifically on Energy Economics – Colorado School of Mines, University of Wyoming, and Illinois State University. Many of the Resource and Environmental
Economics programs touch on energy issues, but are not energy-specific. Rather they tend to focus on environmental management principles. Moreover, graduate degree programs focused on energy are not focused on the study of markets and economic principles; rather they are engineering focused or business school centric, which contributes to the MEECON program at Rice being unique.

III. Learning Objectives

The professional masters degree Master of Energy Economics program will introduce students to the economic principles vital to understanding how energy supply and demand are determined, and how various policy and market-oriented constraints shape market behavior and evolution. This will, in turn, prepare students for more meaningful professional engagement in the energy industry. Upon completion of the Rice MEECON, students will be able to produce insightful analysis of energy markets to inform such things as capital asset decisions, firm strategic direction and future market orientation. More specifically, students will:

- learn to analyze energy markets and the micro and macro impacts of various stimuli;
- develop quantitative skills to better utilize data to inform strategic decisions;
- obtain insights into commercially-oriented analysis through internships;
- gain a better understanding of the factors that contribute to dynamic and perpetually changing energy markets.

IV. Marketing and Outreach

The professional masters degree Master of Energy Economics program at Rice University has been and will continue to be advertised through multiple channels, each of which is deemed vital to ensuring the program’s success.

- To begin, the MEECON has been detailed on the new Economics Department website so that anyone interested in economics at Rice is able to learn more about the program.
- Second, the Center for Energy Studies at Rice University’s Baker Institute has been advertising the MEECON on its website and through outreach to its membership. This avenue in particular has raised awareness of the program to numerous energy professionals in both the Houston area and globally.
- Third, the MEECON has been highlighted through established networks to industry, consulting, government and academia. In industry and consulting, in particular, existing networks involving key Rice Economics and CES faculty will be further developed in order to raise awareness of the program and, importantly, establish funding and internship pathways for MEECON students.
- Finally, the establishment of the MEECON was advertised to Rice University undergraduates enrolled in courses in economics and other disciplines in order to highlight the opportunity for those interested.

By utilizing each of these channels, enrollment in the MEECON is expected to grow in successive years until it reaches a level that ensures its long term success.
V. **Degree Requirements**

The professional masters degree Master of Energy Economics program requires students to complete 40 credit hours in 12 months, organized in four sessions. Sessions I and II correspond to the Fall and Spring semester, respectively, and follow the standard Rice academic calendar. Sessions III and IV are two, consecutive 7-week-long sessions that take place during the summer. The credit distribution is as follows:

<table>
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<tr>
<th>3 courses in Session I (Fall)</th>
<th>Electives:</th>
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<tbody>
<tr>
<td>• Energy Economics I</td>
<td>• Energy and the Macroeconomy</td>
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<tr>
<td>• Microeconomics of the</td>
<td>• Geopolitics of Energy</td>
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<tr>
<td>Energy Sector</td>
<td>• Management of Public Policy Issues by Energy Companies</td>
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<tr>
<td>• Applied Econometrics for</td>
<td>• International Trade in Energy</td>
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<tr>
<td>Energy Markets</td>
<td>• Taxation in the Energy Sector</td>
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<tr>
<td>3 courses in Session II (Spring)</td>
<td>• Corporate Finance for the Energy Sector</td>
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<tr>
<td>• Energy Economics II</td>
<td>• The Economics of Energy and the Environment</td>
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<tr>
<td>• Elective</td>
<td>• The Economics of the Electricity Industry</td>
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<tr>
<td>• Elective</td>
<td>• Transportation Economics</td>
</tr>
<tr>
<td>3 courses in Session III (Summer I)</td>
<td>• Industrial Organization of the Energy Sector</td>
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<tr>
<td>• Elective</td>
<td>• Risk Management in Energy</td>
</tr>
<tr>
<td>• Elective</td>
<td>• Internship</td>
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All courses (including required courses and electives) are graduate-level. An internship is required in the Summer II session for completion of the MEECON. The internship will provide students with practical experience relative to the degree. In addition, the internships provide prospective employers with an opportunity to effectively evaluate new talent. The internship is meant to last 7 weeks and should be directly related to their core area of study in the MEECON degree program. It is recognized that some students may have previous professional experience in their area of study, and that their employer may be sponsoring their MEECON education. Thus, students who already work in their area of study may be able to fulfill the internship requirement by working on a special project with their current employer.

Applicants for the professional masters degree Master of Energy Economics program are encouraged to have:
- B.S. or B.A. degree (except Rice students who may apply to the MEECON program in the first semester of their senior year).
- GRE or GMAT is recommended but not required.
- Three letters of recommendation.
• Approved TOEFL scores for applicants whose native language is not English and who did not receive a degree from a country in which English is the official language of communication.

VI. Faculty

• Kenneth B Medlock III, PhD, Director MEECON
• Peter Hartley, PhD, Co-director MEECON
• Ted Temzelides, PhD
• Robin Sickles, PhD
• Mahmoud El-Gamal, PhD
• George Zodrow, PhD
• Jim Krane, PhD
• Regina Buono, JD
• Anna Mikulska, PhD
• Julio Cacho, PhD
• John Kelly, PhD