25 September 2014

TO: Wendy Crone, Interim Dean of the Graduate School

FROM: Kathyrn VandenBosch, Dean, College of Agricultural and Life Sciences

RE: Resource and Energy Demand Analysis MS degree

At its regularly scheduled meeting on September 25, 2014, The College’s Academic Planning Council approved the Department of Agriculture and Applied Economics request to create a new Master’s of Art’s degree program in Resource and Energy Demand Analysis (REDA). However, the approval of the program is contingent on approval of the courses by CALS Curriculum Committee. We understand this motion requires action by the Graduate Faculty Executive Committee and ask that it be placed on their agenda at the earliest possible time. Supporting documents are attached. Please feel free to contact me if you have any questions.

cc: Ian Coxhead
    William Provencher
    Barbara Forest
    Daniel Kleinman
    Kelly Haslam
    Jocelyn Milner
    Katherine Duran
    Sarah Pfatteicher
    Angela Seitler
    Richard Straub
September 10, 2014

CALS Academic Planning Committee
c/o Laura Van Toll
140 Ag Hall

Dear Colleagues:

We are very pleased to present for a second review by the CALS APC our proposal for a new named option within our Master of Arts degree: Resource and Energy Demand Analysis (REDA). This is a revenue-generating program under the Educational Innovation rubric.

What is REDA?
REDA is the first professional training program of its kind, anywhere. The world economy is experiencing booming growth in the development of energy and resource conservation programs and strategies that use smart “green” technology to help people reduce their environmental footprint. Economic modeling, large data sets and cutting-edge analytics are used to answer critical questions about these programs and strategies: Are energy/resources actually being saved? Who exactly is saving energy? How can energy/resource use be reduced further?

REDA is an accelerated 10-month Master’s program designed to produce the professionals to answer these and many other questions. The need for professionals with this training will continue to grow for many years as the world attempts to shift to a low-carbon economy. The economics and quantitative training students receive in REDA will prepare them for a lifetime of interesting, important, and well-paid work in the economic analysis of energy and the environment; a lifetime of “doing good while doing well.”

Bill Provencher, who has 6 years of work experience in this industry, will serve as Program Director. He knows the skill set required, has industry contacts who can serve on the Advisory Committee that will guide the program, and can supply the real-world data that students will use in their capstone course. The results of those capstone projects will serve as powerful credentials for graduates entering the job market.
Progress to date

Jan 16, 2014  Program concept presented to Jocelyn Milner, Sarah Pfatteicher, Katy Duren (DCS), and Kelly Haslam (Grad School)

Feb. 25, 2014  Initial draft of proposal presented to Sarah Pfatteicher

Mar. 4, 2014  Revenue-generating model approved by Tim Norris, Jocelyn Milner, Kelly Haslam

May 5, 2014  First round review by CALS APC

May 27, 2014  Five new course proposals reviewed by CALS Curriculum Committee; feedback addressed and corrected proposals submitted in July 2014

July 25, 2014  Meeting with Jocelyn Milner and Kelly Haslam responding to their detailed feedback on the REDA proposal (Haslam called it “one of the best EI programs we have seen yet.”)

Aug. 8, 2014  AAE signs Memorandum of Understanding on administration and revenue-sharing with CALS

Aug. 2014  Memorandum of Understanding on development costs drafted by Division of Continuing Studies; various meetings with DCS marketing specialists (REDA website design will be used as a prototype by DCS for others planning similar programs)

Sept. 25, 2014  Second CALS APC review

Will AAE have the resources to do this?

The topline answer: Yes, AAE will have the resources. AAE will continue to teach all of the courses it is currently teaching. As made clear in the budget, all program costs, including faculty teaching and administrative support, will be paid out of program revenues. More generally, in the planning process AAE has been very careful to make sure that the program does not impinge on its current resource allocation.

REDA involves the development of five new courses, one of which is a seminar course to be taught/managed by the newly-hired Program Coordinator, who will be Academic Staff. Two others will be taught by Provencher, who is currently part-time and will reduce his private sector work to accommodate the effort that REDA will require. One of the others is an intensive 6-week, online “bootcamp” in mathematical economics. The last course is a modular course split among four faculty. There will also be substantial new administrative tasks associated with the program.

All program costs, including faculty teaching time, will be paid out of program revenues.
Who will benefit from this program?
REDA graduates are highly likely to obtain well-paid positions involving interesting economic analysis.

The REDA program will be financially self-sustaining and will bring additional resources into AAE and CALS. We expect substantial positive spillovers from the program. The 3 TAs used annually in the AAE-based REDA courses will allow AAE to grow its Ph.D. program by 3 students per year. Teaching in these courses will provide valuable experience for TAs. REDA will serve as a “feeder” of high quality students to the Ph.D. program.

Our faculty enthusiastically endorse the notion that revenues from REDA will support our core undergraduate and graduate programs and are eager to see it succeed. CALS will also derive a financial benefit, allowing it to seed new EI programs in the future.

Thank you for reviewing the proposal. We look forward to answering your questions on September 25.

Sincerely,

Ian Coxhead
Professor and Chair
Named Option for the M.A. in Agricultural and Applied Economics: 
Resource and Energy Demand Analysis (REDA) 
Proposal Summary 
September 9, 2014

The Department of Agricultural and Applied Economics proposes to introduce a new named option within the Master of Arts degree: Master of Arts - Agricultural & Applied Economics, with an Option in Resource and Energy Demand Analysis. The AAE faculty approved this proposal for a professional Master’s degree named option at a departmental meeting on May 5, 2014.

1. Short Summary/Overview

This 10-month professional Master’s degree named option will serve the growing number of recent graduates and early-career professionals seeking the quantitative skills necessary for demand-side resource and energy management and analysis, with the expectation for employment in electric and gas utilities, water utilities, energy service companies (ESCOs), government agencies, and consulting firms. Due to economic and technological circumstances, industry demand for resource and energy demand analysis will become far more intensive and extensive over the next 10 years (see Sections 2 and 9 below).

The degree with this named option will be unique in the U.S. It will provide the analytical tools and quantitative skills necessary to analyze energy and resource demand, and design and manage demand-side resource and energy programs and evaluate their impacts. This includes the development of expertise in economic theory and its application in econometric analysis of resource and energy data.

A Program Director (Bill Provencher, currently on the AAE faculty part-time) and Program Coordinator (to be hired) will handle the administration and some teaching. Five new courses have been developed by AAE faculty and will be reviewed for a second time by the CALS Curriculum Committee in September. One of the courses will be a seminar course led by the Program Coordinator, under supervision of the Program Director. The Program Coordinator will be an energy professional, with a Master’s degree in economics and at least 3 years of professional experience in the energy industry conducting the type of analysis that is at the core of the program. Professor Provencher will teach two of the courses. The other two courses will be taught by other AAE faculty as explained below.

Program features:

- Cohort-based, with a lock-step curriculum.
- Close collaboration with industry professionals. The program will be guided by a Program Advisory Committee (PAC) composed of AAE faculty, industry professionals, and UW faculty involved in energy research. A seminar series in spring semester will draw on the exceptionally high concentration of leading energy consulting firms in Madison.
- Three courses (10 credits) in statistics and econometrics, including a one-semester course in econometric methods for resource and energy demand analysis.
- May/June capstone course (AAE 774, “Practicum in Resource and Energy Demand Analysis”) draws on a secure data archive of energy efficiency programs assembled by AAE. Students synthesize their training in a simulated “real world” analysis, with the course designed to reflect the full range of professional responsibilities of a resource/energy demand analyst. The product is a paper of sufficient quality to present at an industry conference.
2. Background/Rationale

A 2010 report by Lawrence Berkeley National Laboratory, “Energy Efficiency Services Sector: Workforce Size and Expectations for Growth,” estimates that in the United States the energy efficiency services sector will increase two- to four-fold by 2020, to 220,000 person-years of employment (PYE) (low-growth scenario) or up to 380,000 PYE (high-growth scenario). A portion of this growth will involve the development, implementation, and evaluation of energy efficiency technologies and programs offered by private technology firms and gas and electric utilities.\(^1\)

This program is designed to train the professionals needed to analyze and manage these offerings, and similar technology/program offerings in other resource sectors, such as the water sector. These professionals include utility program administrators, ESCO staff, government staff, and program support contractors (consulting firms).

The potential for program growth is also evident in the potential for growth in demand-side management in the energy industry. The U.S. Energy Information Agency predicts that demand response and energy efficiency programs will add peak-time savings of approximately 75 GW between 2010 and 2020, a 3-fold increase.\(^2\) Navigant Research, the energy research practice of Navigant consulting, forecasts the following:

- Global expenditures on energy demand response –reductions in energy demand during peak load hours –will increase from 30.8 gigawatts (GW) in 2014 to 196.7 GW in 2023.
- The worldwide market for smart grid data analytics is likely to grow steadily through 2020, with cumulative worldwide spending from 2012 through 2020 totaling just over $34 billion. The bulk of this spending will occur in Asia Pacific, where annual investment will surpass $2.5 billion by 2020.
- Expenditures on consumer engagement data analytics in the energy sphere is expected to increase more than 5-fold in North America, from about $40 million in 2012 to $220 million in 2020, and 6-fold globally.
- Dramatic growth will occur in smart technologies for energy conservation. Globally, revenues from smart thermostats are expected to grow from about $100 million in 2013 to almost 1.4 billion in 2020. Half of this revenue will be in North America. Global growth in smart appliances will be on an even larger scale, increasing from about $2 billion in 2013 to $35 billion in 2020.

3. Name of Program and Implementation

Pending approval, we plan for student enrollment to start in Fall 2015 with an anticipated initial class of 10-20 students. Full ramp-up to a target of 25-30 students will be completed by Year 3 (Fall 2017).

Degree name: Master of Arts in Agricultural and Applied Economics

Option name: Resource and Energy Demand Analysis

Designation on Diploma: Master of Arts – Agricultural and Applied Economics

Designation on Transcript:

- Master of Arts
- Major: Agricultural and Applied Economics
- Option: Resource and Energy Demand Analysis


4. Current Degree vs. Proposed Option and Their Curricula

The REDA curriculum requires the development of 5 new courses. The only elective involves taking either AAE 671 Energy Economics, or AAE 531 Natural Resource Economics, which are existing courses. All program courses except one, Public Affairs 871, are taught in AAE. We have an agreement with the instructor of Public Affairs 871 to allow REDA students to enroll in exchange for funding a TA for the course.

The program is completed in 10 months: fall, spring, and an early summer session, with 30 credits. Details of the program curriculum are provided in Appendix 1.

The current M.A. (non-thesis) and M.S. (thesis) options in AAE allow students to choose 15-21 credits of course work, including 6 credits of electives. Students always take 2 years, or even 2 years and a summer, to complete the 30-credit degree. Our current terminal Master’s program is small, with 2-3 graduates/year.

Table 1. Comparison of Current and Proposed Master’s programs

<table>
<thead>
<tr>
<th>Current Master’s Degrees</th>
<th>Proposed Professional Master’s*</th>
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<tr>
<td>Master of Arts</td>
<td>Master of Science</td>
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<tr>
<td>Microeconomic theory – 3 cr.</td>
<td>Microeconomic theory – 3 cr.</td>
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<tr>
<td>Econometrics - 6 cr.</td>
<td>Econometrics - 6 cr.</td>
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<tr>
<td>Economic Analysis (any AAE course &gt;400) – 6 cr.</td>
<td>Thesis – 6 cr.</td>
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<tr>
<td>Electives (any course &gt;300) – 6 cr.</td>
<td>Electives (any course &gt;300) – 6 cr.</td>
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|                         | Seminar in resource and energy analysis – 3 cr. |
|                         | Practicum – 4 cr. |

* See detailed curriculum in Appendix 1.

5. Administrative Structure and Governance

The AAE faculty and Executive Committee will have governance responsibility for the new REDA program. In addition, we will assemble a Program Advisory Committee (PAC) that includes AAE faculty, other UW faculty engaged in energy research, and industry experts based in Madison. This committee will assure that learning objectives match the skill set needed in the targeted employment sectors.

The Program Director will be assisted by a Program Coordinator (instructional academic staff, with some teaching responsibilities), with additional help from department administrative and IT staff. Teaching assistants will offset increased enrollment in existing courses and provide instructional support in four of the new courses. The relevant department standing committees, such as Admissions and Curriculum, will oversee those facets of the program.

6. Admissions and Degree Requirements

Applicants will be required to have as prerequisites one course in introductory statistics and one course introductory economics, as well as GRE scores (75th percentile or higher) and the TOEFL for international applicants. The TOEFL score should be high enough to exempt the applicant from on-campus ESL training (above 96). The admissions process will be managed by the Program Coordinator, and the Program Director and Graduate Committee will review applications.

The degree requirements are shown in Table 1 in Section 4, above, and in more detail in Appendix 1.
7. Curriculum

Details of the program curriculum are provided in Appendix 1. It is cohort-based, involves no electives except the choice between AAE 531 Natural Resource Economics and AAE 671 Energy Economics, and includes the following features:

- Emphasis on econometric methods. The program includes a 6-week online August-September prep in economics and statistics, followed by two full semesters of econometric methods, including a course focused on the methods appropriate for resource and energy demand analysis, followed by a summer session (May-June) practicum using the skills developed in the econometrics sequence.

- Close collaboration with industry professionals. The program will be guided by an Advisory Committee composed of AAE faculty, local industry professionals, and UW faculty involved in energy research. A seminar series in spring semester draws on the exceptionally high concentration of leading energy consulting firms in Madison.

- May/June practicum draws on a secure data archive of energy efficiency programs assembled by AAE. The practicum will present students with a real-world workplace scenario, in which they work in teams to retrieve, clean and analyze data and produce a final report. Taken for one credit in spring and three credits in the May-June (ADD) summer session, it will emphasize professional skill building in classroom and supervised independent work. The product is a paper of suitable quality for presentation at an industry conference.

Five new courses will be developed by AAE faculty. One of the courses (AAE 770) is an on-line course and another (AAE 773) is a seminar course, both of which will be managed by the Program Coordinator. AAE faculty will teach the three remaining courses.

Proposals for the new courses have been developed, approved by the AAE faculty, and reviewed by the CALS Curriculum Committee on May 5, and will be reviewed again on September 30 to submit alongside the proposal to GFEC and UAPC in fall 2014. We will submit the course proposals for consideration at the first available University Curriculum Committee in fall 2014.

8. Collaborations/Partnerships

The program is designed to foster a close partnership with Madison’s large community of professionals engaged in the analysis of demand-side resource and energy programs. The partnership will include:

- Industry representation on the Program Advisory Committee.
- Presentations by industry professionals in the course, “Seminar in Resource and Energy Analysis.”

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3 Firms involved in demand-side energy analysis with offices in Madison include:

- Focus on Energy, [https://focusonenergy.com/](https://focusonenergy.com/)
• The development of a unique, secure archive on UW servers of energy consumption data from utilities across the U.S., to be used for instruction in the program.

9. Demand/Enrollment Projections

Our best estimate is that after ramp-up the program will enroll 25-30 students per year, though our budget estimate uses a more conservative figure of 20 students per year. Program enrollment depends on several factors: existence of competing programs, interest/support among employers (which affects the long term viability of the program), and interest among recent college graduates, both domestic and international. More generally, the long-run viability of the program depends on industry growth. Each of these factors is discussed below. The empirical data we have in hand indicates good prospects for the program, as detailed below.

Existence of competing programs. A DCS marketing analyst found that there are no competing programs. This confirms AAE’s own informal survey of the field. This fact informs our projection of 50% residents and 50% non-residents for tuition purposes. Because the program is unique we expect to draw on a national and international applicant pool.

Interest among employers/Demand for program graduates. The DCS marketing analyst also completed interviewing industry experts about the prospects for the program. The interviews revealed the following:

• Strong support for the program: “Overall, employers were supportive and enthusiastic about the Master’s program ideas, stating the need for such programs within the industry.”
• Strong indication of employment opportunities: “Employers felt that graduates would be able to compete successfully for a job in energy program evaluation, with some stating they would consider graduates from these programs themselves.”
• Employers supported the program design: “Employers agreed with the skills that would be taught in both programs.”

Interest among U.S. college students. To address this issue we presented a lecture on energy demand issues and programs in AAE 343 (Environmental Economics), and then described the program (including tuition cost and likely salary upon graduation) and surveyed students using iclickers about their interest in the program using the following question: “Would you be interested in being on a mailing list that lets you know whether the program is approved?”

Of 95 students responding, 36 (38%) responded that they would be “strongly interested;” 30 (31%) responded that they would be “somewhat interested;” and the remaining 29 chose the response, “No, not my cup of tea.” In other words, about 70% of the students responding indicated at least some interest.

Interest among international students. AAE has also explored the demand for the program among Chinese students. Regarding the demand for such a program from students in China, Prof. Guanming Shi cites China’s increasing demand for clean energy and dramatic improvement in middle class household incomes as factors predicting success recruiting participants from this market. The one-year length of the program is cost effective, given that the usual time for a Master’s degree in China is 2-3 years. The applied nature of the program content is appealing for students who are interested in looking for a job in industry, especially the emerging energy market. Finally, a degree from a top-tier university like UW-Madison will give them comparative advantage in the job market in China, Hong Kong and Singapore. We have established relationships with several universities in Beijing, Shanghai, Shenyang and Wuhan through faculty research collaboration. This will enable us to reach students directly in those universities for recruiting purposes.

Long-run viability of the program: factors causing growth in energy demand analysis. Five factors predict substantial future growth in demand-side resource and energy management both nationally and internationally, and consequently growth in the proposed Master’s named option program.

First, advanced metering infrastructures (AMI) –smart meters—are being installed at a steady rate for both water and energy in buildings in the U.S. and globally, and this steady increase is expected to continue into the foreseeable future. This is shown for smart water meters in Figure 1, below, and for smart energy meters in
Figure 2. AMIs provide for an expanded menu of resource and energy conservation programs, in particular peak demand management programs and dynamic pricing programs. Figure 3 shows the rise in expenditures on energy-related smart meter analytics in the United States.

Second, advances in smart technology—energy apps on smart phones and other hand-held devices, smart thermostats, smart appliances, etc.—substantially lower the cost of saving energy, making DSM programs more cost effective.

Third, the “Opower Effect” (see http://www.opower.com) has convinced utilities—and more importantly, state utility commissions—that they can indeed save energy with demand-side management programs, and that well-structured DSM programs can allow very precise measurement of programs with a relatively small savings per customer.

Fourth, the natural gas boom, although having the effect of lowering energy prices in the short term, will increase the creation of demand-side energy programs in the medium term. This is because natural gas integrates with renewables much better than do nuclear and coal, the major alternatives to gas. As gas replaces coal and nuclear energy in the base load and the price of renewable energy continues to drop, the energy infrastructure will increasingly involve an integrated system of gas and renewables in which gas compensates for the intermittency of solar and wind. With renewable energy firmly integrated in the power system, the opportunity arises for better integration of demand side energy conservation as a bridge between natural gas and intermittent renewables.

Finally, the recently (June 2) proposed rule by the EPA to reduce carbon emissions by U.S. power plants by 30% by 2030, and the more general national shift toward green, sustainable living, creates incentives and a political environment highly favorable to energy demand management.
10. Faculty

AAE faculty are listed on the department website: [http://www.aae.wisc.edu/people/faculty/](http://www.aae.wisc.edu/people/faculty/). Bill Provencher is leading the development of the program, and would serve as Program Director in the first few years of the program. He is a full professor currently with a part-time appointment, and is an Associate Director in the energy practice at Navigant Consulting. Faculty scheduled to teach in the new, REDA-specific courses include Brian Gould (AAE 770), Jennifer Alix-Garcia, Ian Coxhead, Jeremy Foltz, and Guanming Shi (AAE 771; the course is modular, with each of the four faculty members teaching one of four modules); and Bill Provencher (AAE 772, AAE 774). Other faculty teaching existing courses that will be used in the program include Dan Phaneuf (AAE 636, AAE 643), Sheldon Du (AAE 671), Nick Parker (AAE 531), and Greg Nemet (PA 809).4

4 With the approval of Susan Yackee, Director of PA, Greg Nemet has agreed to allow REDA students into his course on the condition that AAE provides funding for a TA for the course. This expense is in the REDA budget.
11. Financial Support

No financial support will be available to students in this program.

12. Budget Implications (cost-recovery budget, if applicable)

Budget details are provided in Appendix 2.

The essential features of the budget are the following:

- First year development costs are estimated at $157,688, composed of faculty salaries/fringe for course development ($69,646), IT and equipment costs and administrative support ($38,042), and marketing costs ($50,000). These one-time start-up costs will be covered by the Division of Continuing Studies (DCS).

- Net program revenues are conservatively estimated to be about $155,000. This estimate assumes 10 out-of-state students and 10 in-state students enrolled in the Master's named option program. We expect to break even in the second year of the program, to get to this 10-10 level of enrollment in the third year of the program, and to average 25-30 students in subsequent years.

To provide a sense of the program risk, break-even enrollment combinations —enrollment combinations necessary for the program to generate annual net revenues of about $0—include an 8-8 combination (8 in-state students and 8 out-of-state), a 5-9 combination, and a 12-6 combination.

AAE’s share of positive net revenues will be used to reduce/eliminate any program-related debt incurred in previous years. Once the debt is eliminated, net revenues will be used to enhance the educational mission of AAE through activities such as the following:
  - Fund graduate student research assistantships
  - Provide funding for graduate student travel to research conferences
  - Provide travel funds to prospective students for campus visits
  - Support undergraduate scholarships
  - Provide travel funds for invited speakers
  - Support instruction-related departmental infrastructure

13. Overlap with Other Programs, and Program Spillovers

AAE has discussed this new program with faculty in the Nelson Institute, the La Follette School of Public Affairs, the Wisconsin Energy Institute, the Statistics Department, and the Economics Department. Each has indicated the potential for synergistic activities, and none has indicated a conflict with other ongoing or planned programs at the university.

The only course in the program that will not be taught by AAE faculty is PA 809, Introduction to Energy Policy and Analysis, taught by Greg Nemet. Professor Nemet has agreed to accept program students in his class in exchange for a TA to handle the extra work load.

We do not anticipate REDA to affect enrollment in our current Master’s program because they are so distinctly different. REDA is a unique, niche program designed for a particular (but fast-growing) job market. Our traditional Master’s students go into a variety of positions with international development NGOs, agribusiness concerns, government agencies, etc. (We also award Master’s degrees to our Ph.D. students as they progress through their program.)

Significantly, the budget of the program provides adequate funding support to avoid negative effects of REDA on the quality and staff/resource support of existing AAE graduate and undergraduate programs. Where REDA students are added to existing courses, TAs are provided. The budget includes a Program Director and Program Coordinator to handle program administration, as well as administrative and computational support.
On the other hand, we expect substantial positive spillovers due to the program. The 3 TAs used annually in the AAE-based REDA courses will allow AAE to grow its Ph.D. program by 3 students per year. Teaching in these courses will provide valuable experience for TAs. REDA will invariably serve as a “feeder” of high quality students to the Ph.D. program.

More generally, REDA will provide substantial positive spillovers to the research mission at UW. UW currently has virtually no presence in the analysis of energy demand. The WEI’s current focus is on the supply/engineering side of things. This should be the priority, because the movement towards clean, sustainable energy will be technology driven. Nonetheless, the adoption and success of new technology will be mediated by consumer behavior, and consumer behavior will depend on demand-side management and policy.

No university can claim that it is a leader in the energy field if it does not have a research presence in the economics of energy demand management and policy. REDA will grow this presence/expertise at UW. The very fact that in REDA we would have a program that involves 20-30 students obtaining graduate degrees in energy demand analysis will foster the expertise. It will bend the research program of those teaching the courses to include energy demand analysis. Completely organically if not incidentally, in 5-10 years UW will become one of the top 5 universities in the country in research on energy demand analysis at the very moment when the value of such research, and U.S. and global financial support for it, is sharply rising due to concerns about climate change and other environmental damages from fossil fuels, and the recognition of the potential of smart technologies to maximize the value of energy demand management.

14. Assessment and Program Review Plan

The program is intended to prepare students for careers in resource and energy demand analysis. Consequently the program provides students with the graduate-level training in economics and quantitative methods, with emphasis on statistical methods, that they will need in these careers. Assessment of the program involves two lines of examination:

- Is the program meeting its learning goals? That is, is it successfully teaching students the intended material?
- Is the program meeting its program goals? Is it teaching high-quality students the right material for the intended professional market in a sustainable way?

Figure 4 presents a schematic of the assessment inputs and the overall assessment process. Details are discussed below.

**Assessment of learning goals.** Learning goals, and the courses expected to achieve the goals, are presented in Table 2. Data that will be used to contribute to an evaluation of whether students are achieving learning goals include the following:

- *Course grades.* A general benchmark of successful attainment of learning goals is a GPA of 3.3 or higher by at least 90% of program students.
- *Program entry exam.* For AAE 770, a test of student understanding of basic math and statistics administered both before the start of the course and after completion of the course. The course will be adjusted to reflect the level of student understanding of the material upon entering the program.
- *Capstone products.* The capstone course (AAE 774) is designed to mimic a real-world work environment, with realistic “deliverables” based on real-world data sets, completed on tight deadlines and delivered in reports, web-based teleconferences with PowerPoint, and presentations. The written products will serve as credentials to present to prospective employers. These products will provide an excellent opportunity to determine whether students have sufficiently absorbed and synthesized the program material, and whether certain material, of which mastery is indicated by standard assessment tools (course problem sets and exams), is not being successfully integrated into the student’s professional skill set. In other words, students may indicate mastery of the material when evaluated in
the standard, directed setting of a classroom, but may not understand it sufficiently to apply it well in the many novel analytical settings likely to be encountered in the real world.

- **Student course evaluations.** Course evaluations will be designed to elicit whether the student believes the course is meeting its intended learning goals.
- **Student program evaluation survey.** A detailed, structured program evaluation survey to be completed by all students at the end of the program. The survey will address whether the student believes the program accomplishes its intended learning goals, seek recommendations about how to change the curriculum if it isn’t, and inquire about additional learning goals the student believes should be included in the program.
- **Program alumni survey.** Alumni who have been in the industry for at least a year will be surveyed about what learning goals should be strengthened and added to improve the program.

**Annual review of learning goals.** At the end of each program year, a comprehensive review will be undertaken to assess learning goals, as illustrated by the blue-shaded area in Figure 4. The first of two initial steps in the review process will be carried out by the Program Director, Program Coordinator, and the faculty involved in teaching the REDA courses, who, aided by data from course evaluations and the AAE 770 pre/post evaluation, will meet to discuss the following:

- Which learning goals are students having the greatest difficulty mastering, and what steps can be taken to address shortcomings?
- Based on the annual review of program goals (see below), are there learning goals that should be dropped? Are there goals that should be added?

The outcome of the meeting will be a written report produced by the Program Director and Program Coordinator, “Instructor-based REDA learning assessment report,” enumerating:

- Those learning goals that are being met;
- The goals that are not being met, and the changes in the curriculum necessary to address the deficiency; and
- The goals that should be added, subtracted or altered—and how the changes will be incorporated in the program curriculum—to better position graduates for professional careers in resource and energy demand analysis.

The second review step involves a review of the program from the perspective of students and alumni. Data for the review will include the course evaluations, the student program evaluation survey, and the program alumni survey. The Program Director and Program Coordinator will synthesize this material in a written report, “Student-based REDA learning assessment report”.

As shown in Figure 4, the two assessment reports will be presented to the Program Advisory Committee (PAC), which will be asked to provide feedback and recommendations, with particular emphasis on insights provided by industry members about the needs of industry, nascent industry challenges that might require new or altered learning goals, and so forth. The PAC will then draft an Annual Memorandum of Recommendations that includes recommended curricular changes to better achieve desired learning goals. The AAE Graduate Committee will review the PAC recommendations and the learning assessment reports and move all or selected and additional recommendations to the full faculty for approval.

**Assessment of program goals.** The overarching goal of the program goal is to provide students with the training and skills necessary to obtain high-impact, high-quality professional positions as resource/energy demand analysts. The program must be sustainable and able to respond to changing market opportunities.

Specific program goals are the following:

- **Enrollment of high-quality students.** Average undergrad (or grad) GPA of 3.5 or better, Average GREs scores greater than the 75th percentile.
- **Steady increase in program enrollment.** Program enrollments of at least 10 students in the first year, 15 students in the second year, 20 students in the third year, and 25-30 students in subsequent years.
• Positive net revenues...in program Year 3 and all subsequent years.
• Debt-free by Year 4.
• High rate of job placement. Place at least 80% of students in the resource/energy industry as professional analysts, with the remaining 20% proceeding to PhD programs in graduate school or economic analyst positions in other (non-resource/energy) fields.
• High student satisfaction. At least 80% of students expressing high satisfaction in the student program evaluation survey (As indicated in Figure 4, this survey will be used to assess both learning goals and program goals).
• High satisfaction of alumni. At least 80% of students expressing high satisfaction with the program 1 year after leaving the program (as determined from the program alumni survey).
• Adaptability. Sensitivity and fast adaptation to changing market needs.

Annual review of program goals. At the end of each program year, a comprehensive review will be undertaken to assess program goals, as illustrated by the red-shaded area in Figure 4. The Program Director, The Program Coordinator, and the Department Outreach Specialist will assemble all information relevant to program goals in an annual report, “REDA program assessment report”. The program report will be presented to the Program Advisory Committee, which will be asked to provide feedback, additional insights, and recommendations about how to alter the program structure to increase the opportunity for success. The PAC will then draft an Annual Memorandum of Recommendations that includes recommended structural changes to the program to better achieve desired program goals. The AAE Graduate Committee will review the PAC recommendations and the program assessment report and move all or selected and additional recommendations to the full faculty for approval.

Third year program assessment. In the third annual review, the process described above and diagrammed in Figure 4 will be linked to the regular review cycle mandated by CALS, addressing the question of whether the program should be continued or terminated.

Table 2. REDA Learning Goals

<table>
<thead>
<tr>
<th>Learning goal</th>
<th>Courses designed to achieve the goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mastery of the foundations of economic quantitative analysis</td>
<td>AAE 770</td>
</tr>
<tr>
<td>Working knowledge of the neoclassical economic model of consumer demand theory and its implications for modeling and analysis of resource and energy demand</td>
<td>AAE 771, AAE 643, AAE 671/531</td>
</tr>
<tr>
<td>Mastery of the implication of recent advances in behavioral economics and choice theory for resource and energy demand analysis</td>
<td>AAE 643, AAE 772, AAE 773</td>
</tr>
<tr>
<td>Working knowledge of the basic theoretical and applied models used in resource economics, environmental economics, and energy economics, and their implications for resource and energy policy</td>
<td>PA 809, AAE 643, AAE 671/531</td>
</tr>
<tr>
<td>Working knowledge of the principles of survey design and implementation</td>
<td>AAE 771, AAE 772, AAE 773</td>
</tr>
<tr>
<td>Mastery of resource and energy program design and implementation</td>
<td>AAE 636, AAE 772, AAE 773</td>
</tr>
<tr>
<td>Mastery of statistical modeling and methods applicable to resource and energy demand analysis</td>
<td>AAE 636, AAE 772</td>
</tr>
</tbody>
</table>
15. Summary

In light of national and global policies to reduce the use of fossil fuels and increase energy and resource conservation, the increasing integration of renewables in the U.S. power system and power systems around the world, and the rapid growth of smart technologies in the resource and energy sectors, it appears there will be high demand for professionals with a background in quantitative analysis and resource and energy economics. This program will be the first in the U.S., and likely the world, to directly target this demand.
### Appendix 1: Program Curriculum Detail (new courses are shaded □)

<table>
<thead>
<tr>
<th>Course name and number</th>
<th>Pre-reqs</th>
<th>Description</th>
<th>Cr</th>
<th>Instructor</th>
<th>Other remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall (13 credit hours)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Course name and number</strong></td>
<td><strong>Pre-reqs</strong></td>
<td><strong>Description</strong></td>
<td><strong>Cr</strong></td>
<td><strong>Instructor</strong></td>
<td><strong>Other remarks</strong></td>
</tr>
<tr>
<td>AAE 770 Introduction to Quantitative Methods in Resource and Energy Economics</td>
<td>Enrollment in REDA</td>
<td>The fundamental mathematics and statistics necessary for the study of quantitative methods in resource and energy demand. Topics include the mathematics of optimization and its role in basic welfare theory and consumer demand; linear and matrix algebra and their application in both modeling consumer behavior and the statistical analysis of models; and the fundamentals of statistical analysis relevant to econometric analysis of resource and energy demand, including probability theory, sampling distributions, and statistical inference. The course is an intensive preparatory course that begins in August and ends in mid-September.</td>
<td>3</td>
<td>Gould and Program Coordinator</td>
<td>Online; 1 TA</td>
</tr>
<tr>
<td>AAE 636 Applied Econometric Analysis 1</td>
<td></td>
<td>First Master's-level course in econometrics, including introductory topics in program evaluation.</td>
<td>3</td>
<td>Phaneuf</td>
<td>1 TA</td>
</tr>
<tr>
<td>AAE 771 Theory to Practice: Fundamentals of Resource and Energy Demand Analysis</td>
<td>Enrollment in REDA</td>
<td>Applying economic theory to the practice of resource and energy demand analysis. Topics include consumer demand theory and the proper modeling of demand systems, theoretical underpinnings of behavioral economics, welfare theory, cost benefit analysis and cost-effectiveness analysis, and technology adoption and diffusion.</td>
<td>4</td>
<td>Alix-Garcia Coxhead Foltz Shi</td>
<td>1 TA</td>
</tr>
<tr>
<td>Pub Affrs 809 Introduction to Energy Policy and Analysis</td>
<td></td>
<td>Interdisciplinary seminar for the Energy Analysis and Policy Curriculum. Strategy and policy problems in energy policy, both national and international.</td>
<td>3</td>
<td>Nemet</td>
<td>1 TA</td>
</tr>
<tr>
<td><strong>Spring (14 credit hours)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Course name and number</strong></td>
<td><strong>Pre-reqs</strong></td>
<td><strong>Description</strong></td>
<td><strong>Cr</strong></td>
<td><strong>Instructor</strong></td>
<td><strong>Other remarks</strong></td>
</tr>
<tr>
<td>AAE 671 Energy Economics or AAE 531 Natural Resource Economics</td>
<td></td>
<td>671 Survey course on the methods, application, and limitations of traditional economic approaches to the study of energy problems. 531: Economic concepts and tools relating to management and use of natural resources.</td>
<td>3</td>
<td>Du Parker</td>
<td></td>
</tr>
<tr>
<td>AAE 772 Applied Econometrics of Resource and Energy Demand</td>
<td>AAE 636, enrollment in REDA</td>
<td>The estimation of the economic models of resource and energy demand, including evaluation of energy and resource programs, estimating demand systems in the study of dynamic pricing models, estimating discrete choice models, Forecasting resource and energy demand from econometric models, and topics in the application of big-data analytics in resource and energy demand analysis.</td>
<td>4</td>
<td>Provencher</td>
<td>1 TA</td>
</tr>
<tr>
<td>AAE 773 Seminar in Resource and Energy Demand</td>
<td>AAE 771, Enrollment in REDA</td>
<td>Current issues in resource and demand analysis, with weekly presentations by academic researchers and industry professionals, and an emphasis on identifying the correct conceptual approach and methods to address an issue.</td>
<td>3</td>
<td>Program Coordinator</td>
<td></td>
</tr>
<tr>
<td>AAE 643 Foundations of Environmental &amp; Natural Resource Economics</td>
<td></td>
<td>Focus areas include foundational models of human/environment interaction, definition and evaluation of the suite of environmental policy instruments, measuring environmental costs and benefits, and examining natural resource use.</td>
<td>3</td>
<td>Phaneuf</td>
<td>1 TA</td>
</tr>
<tr>
<td>AAE 774 Practicum in Resource and Energy Demand Analysis</td>
<td>AAE 771, Enrollment in REDA</td>
<td>The capstone course in Resource and Energy Demand Analysis, in which students synthesize their training in a simulated “real world” analysis. The course is designed to reflect the full range of professional responsibilities of a resource/energy demand analyst, from data retrieval/cleaning to analysis to reporting.</td>
<td>1</td>
<td>Provencher</td>
<td>Continues in the ADD 4-week summer session; 1 TA</td>
</tr>
<tr>
<td><strong>May-June Summer Session (ADD; 3 credit hours)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AAE 774</td>
<td>Practicum continues; Both terms are graded.</td>
<td>3</td>
<td>See above</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
# Appendix 2: Budget Detail

## DEVELOPMENT COSTS (Nov 2014-Aug 2015)

<table>
<thead>
<tr>
<th>Salary/Expense</th>
<th>Fringe Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course/content design (4 summer months)</td>
<td>$53,574</td>
<td>$16,072</td>
</tr>
<tr>
<td>Constructing computer infrastructure</td>
<td></td>
<td></td>
</tr>
<tr>
<td>computer expert time (.5 months)</td>
<td>$5,417</td>
<td>$1,625</td>
</tr>
<tr>
<td>equipment and software</td>
<td>$5,000</td>
<td>NA</td>
</tr>
<tr>
<td>Administrative support</td>
<td>$20,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>Initial marketing and recruitment</td>
<td>$50,000</td>
<td>NA</td>
</tr>
</tbody>
</table>

**total development costs net of marketing:** $81,688
**total development costs:** $157,688

## ANNUAL OPERATING COSTS (beginning July 2015)

<table>
<thead>
<tr>
<th>Salary/Expense</th>
<th>Fringe Rate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program director (flat salary addition)</td>
<td>$13,723</td>
<td>$4,117</td>
</tr>
<tr>
<td>Program coordinator</td>
<td>$75,000</td>
<td>$22,500</td>
</tr>
<tr>
<td>Faculty teaching salary</td>
<td>$72,649</td>
<td>$21,795</td>
</tr>
<tr>
<td>Admin support (.25 time)</td>
<td>$7,500</td>
<td>$3,555</td>
</tr>
<tr>
<td>Teaching Assistants (3.5 9-month slots)</td>
<td>$52,500</td>
<td>$0</td>
</tr>
<tr>
<td>Computer/database support (.20 time)</td>
<td>$13,000</td>
<td>$3,900</td>
</tr>
<tr>
<td>Ongoing marketing, recruitment and</td>
<td>$25,000</td>
<td>NA</td>
</tr>
<tr>
<td>operations</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Total annual operating costs:** $315,239
**CALS EI Administrative Fee (10% of operating):** $31,524

**Total costs:** $346,762

## ANNUAL OPERATING REVENUES

<table>
<thead>
<tr>
<th># of students</th>
<th>Revenue per student</th>
<th>Total revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>$14,080</td>
<td>$140,800</td>
</tr>
<tr>
<td>10</td>
<td>$29,904</td>
<td>$299,040</td>
</tr>
</tbody>
</table>

**Total annual operating revenue:** $439,840

**ANNUAL NET REVENUE (after July 2015):** $93,078
**ANNUAL NET REVENUE RETAINED BY AAE (2/3 of net revenue after July 2015):** $61,990

*Resident tuition: $5929/AY semester; $2230/summer = $14,088
Non-resident tuition: $12,592/AY semester; $4729/summer = $29,913
(Tuition figures are taken from current rates on Registrar’s website)
Appendix 3: Letters of Support

AAE has letters of support from Economics, the Wisconsin Energy Institute, the Nelson Institute, the La Follette School of Public Affairs, and the Statistics Department, attached.
March 31, 2014

Professor Ian Coxhead
Department of Agricultural and Applied Economics
429 Taylor Hall
427 Lorch Street
Madison, WI  53706

Dear Professor Coxhead,

The Economics Department enthusiastically supports the Department of Agricultural and Applied Economics’ proposal to create a Named Option for the M.S.in Agricultural and Applied Economics:  Resource and Energy Demand Analysis (REDA).

Our economics courses are currently set up in a way that space has been available for Agricultural and Applied Economics (AAE) students to help them obtain their degree.  We offer pertinent electives and other relevant courses for them to choose for their course of study.  We do not see this availability changing in the future or with the addition of the new REDA option in their M.S. program. However, if our course availability changes in any way in the future, we will communicate the changes with AAE and discuss other options so as not to hinder the proposed REDA option in their M.S. program.

Again, the Economics Department fully supports the endeavor of the AAE department to implement a Named Option for the M.S.in Agricultural and Applied Economics:  Resource and Energy Demand Analysis.

If we can be of further assistance in the approval process for the proposed REDA option, please do not hesitate to contact me.

Sincerely,

Ananth Seshadri
Economics Department Professor & Chair

Department of Economics
University of Wisconsin-Madison
William H. Sewell Social Science Building 1180 Observatory Drive Madison, Wisconsin 53706
608/263-2989    Fax: 608/262-2033    www.econ.wisc.edu
19 March 2014

To: R. William Provencher, Professor, Agricultural and Applied Economics

From: Michael Corradini, Director, Wisconsin Energy Institute; and Paul H. Zedler, Associate Director for Research and Education, Nelson Institute

Re: Support for the proposed AAE Master's program in resource and energy demand analysis

We, the Directors of the Nelson Institute for Environmental Studies and the Wisconsin Energy Institute, are pleased to indicate our support of the proposed Master’s program in resource and energy demand analysis to be offered through the Department of Agricultural and Applied Economics.

We offer this support because we believe that as proposed it will complement, rather than compete with, existing energy-related offerings and programs at UW-Madison. As you know, we have had discussions about the need for a campus-wide Master’s degree program in energy. We therefore hope that this program will be step towards realizing that objective.

Michael Corradini

Paul H. Zedler
March 31, 2014

Dear Professor R. William Provencher,

I am writing on behalf of the La Follette School of Public Affairs to support the proposed UW-Madison Agriculture and Applied Economics (AAE) Master’s program in resource and energy demand analysis.

We believe this program will be a complement to the Master’s training programs currently being offered at the La Follette School. We hope that AAE’s new program will add new classes and offerings at UW-Madison, which will extend our campus’s leadership in this important area.

My best,

{signed electronically}

Susan Webb Yackee
Director and Associate Professor
La Follette School of Public Affairs
UW-Madison
Date: 19 March 2014
To: Ian Coxhead, Chair, Department of Agricultural and Applied Economics
From: Brian S. Yandell, Chair, Department of Statistics
Re: Master's in Resource and Energy Demand Analysis

Thank you for sharing this proposal for a named option of “Resource and Energy Demand Analysis (REDA)” in the MS in Agricultural and Applied Economics. This looks like an exciting opportunity to address a growing need. We in the Department of Statistics see no conflict with this offering. We are open to collaboration on aspects of this of mutual interest as your ideas, courses and program develop. For instance, the proposed “Math/Stats Review” (AAE 6XX) has potential for synergy with our own rethinking of gateway statistics courses.
Appendix 4: Higher Learning Commission Program Update Template

Higher Learning Commission (HLC) Related Policies: Program Update Template

The template is designed to allow programs to include all degree levels of a single program on one template. However, multiple templates can be used for a single program, if preferred. In many cases, graduate programs can set more rigorous requirements than the Graduate School’s baseline requirements. Please reference the GFEC-Approved Policy Vote Items and FAQ’s for full policy details. If your program seeks to require the same requirements as dictated by Graduate School policy, please confirm by inserting the appropriate details. Otherwise, programs are free to state more rigorous requirements.

Program (Major) Name: Agricultural and Applied Economics

1. Minimum Graduate Residence Credit Requirement:
The Minimum Graduate Residence Credit Requirement requires at least 16 credits for master’s degrees, 24 credits for MFA/specialist certificates, and 32 credits for doctorate degrees. Programs may require a higher Graduate Residence Credit minimum. If you have different credit requirements for different tracks of students at the same degree level, please note that accordingly.

<table>
<thead>
<tr>
<th>Name of degree level and any applicable options/tracks</th>
<th>Residence Credit Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.A. and M.S. – requirements are the same for all options/tracks</td>
<td>16 credits</td>
</tr>
<tr>
<td>Ph.D. – requirements are the same for all options/tracks</td>
<td>32 credits</td>
</tr>
</tbody>
</table>

2. Minimum Graduate Degree Credit Requirement:
The Minimum Graduate Degree Credit Requirement requires at least 30 credits for master’s degrees, 42 credits for MFA/specialist certificates, and 51 credits for doctorate degrees (may include master’s, minor, and dissertator credits). Programs may require a higher Graduate Degree Credit minimum. If you have different credit requirements for different tracks of students at the same degree level, please note that accordingly.

<table>
<thead>
<tr>
<th>Name of degree level and any applicable options/tracks</th>
<th>Degree Credit Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.A. and M.S. – requirements are the same for all options/tracks</td>
<td>30 credits</td>
</tr>
<tr>
<td>Ph.D. – requirements are the same for all options/tracks</td>
<td>51 credits</td>
</tr>
</tbody>
</table>

3. Minimum Graduate Course Work (50%) Requirement:
The Minimum Graduate Course Work Requirement states that at least 50% of credits applied toward the program’s graduate degree credit requirement must be with courses designed for graduate work. Graduate course work can include UW-Madison courses (including but not limited to online, thesis/research, independent study, and practicum/internship credits) that satisfy one of the following guidelines:
• numbered 700 and above;
• numbered 300-699 that are specifically designed for graduate students in a graduate program;
• numbered 300-699 that assess graduate students separately from undergraduate students; or
• numbered 300-699 that have a graduate student enrollment >50% in any given semester.

Programs may be more restrictive with how they define graduate-level work (than the above parameters). Please provide the program’s policy around this requirement. If you have different requirements for different tracks of students at the same degree level, please note that accordingly.

<table>
<thead>
<tr>
<th>Name of degree level and any applicable options/tracks</th>
<th>Graduate Course Work Requirement</th>
</tr>
</thead>
</table>

16
<table>
<thead>
<tr>
<th>M.A. (non-thesis option)</th>
<th>Half of degree course work (15 credits out of 30 total credits) must be completed in courses numbered 700 or higher, or in the following AAE courses clearly designated as “graduate” courses: 520, 526, 531, 540, 635, 636, 637, 641, 642, 643, 671.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.S. (thesis option)</td>
<td>Half of degree course work (15 credits out of 30 total credits) must be completed in courses numbered 700 or higher, or in the following AAE courses clearly designated as “graduate” courses: 520, 526, 531, 540, 635, 636, 637, 641, 642, 643, 671.</td>
</tr>
<tr>
<td>M.A. (named option: Resource and Energy Demand Analysis [REDA])</td>
<td>Twenty-one credits of course work are taken at the 700-level. The remaining 9 credits are taken at the 600-level but are designed as Master’s level graduate courses.</td>
</tr>
<tr>
<td>Ph.D. – requirements are the same for all options/tracks</td>
<td>Half of degree course work (26 credits out of 51 total credits) must be completed in courses numbered 700 or higher, or in the following AAE courses clearly designated as “graduate” courses: 520, 526, 531, 540, 635, 636, 637, 641, 642, 643, 671.</td>
</tr>
</tbody>
</table>

4. **Prior Course Work Requirements:**

The Prior Course Requirements state a student's program may decide to accept coursework completed outside of the student’s graduate career at UW-Madison when those courses are rigorous and meet the expectations of graduate work for the degree. The chart below summarizes the policy and its intersection with other policies:

<table>
<thead>
<tr>
<th><strong>Prior Graduate Course Work from Other Institution(s)</strong></th>
<th><strong>Course Work from Undergraduate Career at UW-Madison</strong></th>
<th><strong>Transfer from University Special Student Career at UW-Madison</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Graduate Residence Credit Requirement</td>
<td>No</td>
<td>*Allowed up to 15 credits numbered 300 or above if difference in tuition is paid.</td>
</tr>
<tr>
<td>Minimum Graduate Degree Credit Requirement</td>
<td>*Allowed</td>
<td></td>
</tr>
<tr>
<td>Minimum Graduate Course Work (50%) Requirement</td>
<td>*Allowed</td>
<td>*Allowed up to 15 credits numbered 700 or above if difference in tuition is paid.</td>
</tr>
</tbody>
</table>

* Fulfillment of requirements is allowed only if approved by the student’s graduate program up to any stated maximum.

**Course work earned five or more years prior to admission to a master’s degree or course work earned ten or more years prior to admission to a doctoral degree is not allowed to satisfy requirements.

Programs may be more restrictive regarding the type and number of prior course work credits that are allowed to fulfill requirements. Please provide the program’s policy around this requirement. If you have different requirements for different tracks of students at the same degree level, please note that accordingly.

<p>| Name of degree level and any applicable | Prior Course Work Requirements: Grad Work Other Institutions; UW-Madison Undergraduate; and UW-Madison |</p>
<table>
<thead>
<tr>
<th>options/tracks</th>
<th>University Special</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M.A. and M.S. (traditional program)</strong></td>
<td><strong>Grad Work Other Institutions:</strong></td>
</tr>
<tr>
<td></td>
<td>Up to 6 credits allowed. Course work earned five or more years prior to admission to a master’s degree or earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.</td>
</tr>
<tr>
<td></td>
<td><strong>UW-Madison Undergraduate:</strong></td>
</tr>
<tr>
<td></td>
<td>Allowed up to 7 credits numbered 300 or above, with petition from student.</td>
</tr>
<tr>
<td></td>
<td><strong>UW-Madison University Special:</strong></td>
</tr>
<tr>
<td></td>
<td>Allowed up to 15 credits numbered 300 or above if difference in tuition is paid.</td>
</tr>
<tr>
<td><strong>M.A. (named option in Resource and Energy Demand Analysis [REDA])</strong></td>
<td><strong>Grad Work Other Institutions:</strong></td>
</tr>
<tr>
<td></td>
<td>None.</td>
</tr>
<tr>
<td></td>
<td><strong>UW-Madison Undergraduate:</strong></td>
</tr>
<tr>
<td></td>
<td>None.</td>
</tr>
<tr>
<td></td>
<td><strong>UW-Madison University Special:</strong></td>
</tr>
<tr>
<td></td>
<td>None.</td>
</tr>
<tr>
<td><strong>Ph.D.</strong></td>
<td><strong>Grad Work Other Institutions:</strong></td>
</tr>
<tr>
<td></td>
<td>Up to 18 credits allowed of courses taken for a Master’s degree. Course work earned five or more years prior to admission to a master’s degree or earned ten years or more prior to admission to a doctoral degree is not allowed to satisfy requirements.</td>
</tr>
<tr>
<td></td>
<td><strong>UW-Madison Undergraduate:</strong></td>
</tr>
<tr>
<td></td>
<td>Not allowed.</td>
</tr>
<tr>
<td></td>
<td><strong>UW-Madison University Special:</strong></td>
</tr>
<tr>
<td></td>
<td>Allowed up to 15 credits numbered 300 or above if difference in tuition is paid.</td>
</tr>
</tbody>
</table>

5. **Maximum Credits per Term:**

The Maximum Credits per Term allows non-dissertator students to enroll for a maximum of 15 credits per term. Dissertators must continue to enroll in exactly 3 credits related to their dissertation. Programs may set a lower Maximum Credits per Term for non-dissertators through advising or program policy. Please provide the program’s policy around this requirement. If you have different requirements for different tracks of students at the same degree level, please note that accordingly.

<table>
<thead>
<tr>
<th>Name of degree level and any applicable options/tracks</th>
<th>Maximum Credits per Term</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>M.A. and M.S. – requirements are the same for all options/tracks</strong></td>
<td>15 credits (monitored and enforced locally)</td>
</tr>
<tr>
<td><strong>Ph.D. – requirements are the same for all options/tracks</strong></td>
<td>15 credits</td>
</tr>
</tbody>
</table>

6. **Effective Dates:**

The GFEC approved the following implementation effective date parameters:

- Any student entering or readmitted to a graduate program on or after Fall 2014 must adhere to the above requirements.
- Currently enrolled master’s students have the option to complete their degree under the prior policy requirements if they can complete all degree requirements and are awarded the degree before Fall 2016.
- Students enrolled in a MFA, specialist certificate, or doctoral degree prior to Fall 2014 have the option to complete their degree under the prior policy requirements.
- A student who chooses to discontinue their degree program for a semester or more will return under the new policy requirements.

Please provide the program’s policy around these parameters. If you have different requirements for different tracks of students at the same degree level, please note that accordingly.

<table>
<thead>
<tr>
<th>Name of degree level and any applicable options/tracks</th>
<th>Effective Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>M.A. and M.S. – requirements are the same for all options/ tracks</td>
<td>New master’s students must adhere to new program requirements effective Fall 2014. Currently enrolled master’s students have the option to complete their degree under the prior requirements if they graduate before Fall 2016 and are continuously enrolled.</td>
</tr>
<tr>
<td>Ph.D. – requirements are the same for all options/ tracks</td>
<td>New doctoral students must adhere to new program requirements effective Fall 2014. Currently enrolled doctoral students have the option to complete their degree under the prior requirements if they are continuously enrolled.</td>
</tr>
</tbody>
</table>

7. Communication Implementation:
Please check and insert any relevant notations to each of the following communication steps necessary for appropriate and full implementation of the new policies.

X We have or will notify prospective and incoming students about these new policy requirements so they can make informed decisions regarding enrollment.
Notes: We have changed our website and literature as of this date. We have changed Grad School catalog in May.

X We have or will notify current students about these new policy requirements so they understand how they may or may not be impacted.

X We have or will update our Fall 2014 (or 2014-15) program handbook and website where appropriate with these new policy requirements prior to the start of the Fall 2014 term.
Notes: Have already done this.

8. We will be ready to update the Graduate Catalog with these and any other program requirements during the update cycle set to occur between November 2013-April 2014. Please retain a copy of this form as a reference. Notes: N.A.
Memorandum of Understanding Between the College of Agricultural and Life Sciences and the Department of Agricultural and Applied Economics related to the establishment of an academic program funded through 131 funding.

Please note that this MOU is contingent upon appropriate review and approval of the proposed academic programs and courses through normal governance procedures.

Description of Academic Program: See attached request for a new named Option in Resource and Energy Demand Analysis (“REDA”) within the Agricultural and Applied Economics Master of Arts degree. Approval by the CALS APC, GFEC, and UAPC are pending.

- Implementation: September 2015, pending governance approvals.
- Administrative, Academic, and Advising responsibilities will be overseen by: Department of Agricultural and Applied Economics
- Department/Program Contact: Prof. Bill Provencher, program director
- College of Record: CALS

Budget: The original budget, as it appears in the academic program proposal, is attached. The Department intends to seek development and initial marketing funds from the Division of Continuing Studies. Beyond these start-up funds, the Program is expected to be fully self-funded.

- Annual operating costs for the program are estimated at $300,000 per year.
- CALS will assess an EI Administrative Fee equal to 10% of the annual operating costs, or an estimated $30,000 per year.
- Program revenue must first be directed toward paying the expenses of the program, including both the operating costs and the EI Administrative Fee, as well as any accumulated debt in these areas.
- Any net revenue remaining after operating costs, administrative fees, and past debt have been paid is to be split between the Department and the College, with the Department authorized to retain 2/3, and the remaining 1/3 to go to the College.

A full account of the Program’s budget (income and expenditures) will be included in the Department’s annual report to the Dean.

Annual Operational Review: Each year for 5 years, the Department will provide as part of its annual meeting with the Deans, a review of the Program’s academic and fiscal progress. The review will consider such issues as:

- Is the estimate of operating costs sufficient to cover actual costs of running the program? If not, are adjustments needed?
- With respect to enrollment levels, program quality, and similar matters, is the program meeting intended academic goals/outcomes? If not, why not?
- Is the revenue generated sufficient to support the program? If not, are adjustments needed?
- Is the revenue generated meeting other department goals or benefits are outlined in the proposal? If not, are adjustments needed?
- Is the program’s impact on the department’s other curricular activities acceptable given overall department goals? If not, what changes are required?
- Is the program’s impact on the department’s personnel needs in line with goals for this program? If not, what changes are required?
If questions or concerns arise during this annual review that require additional attention, the Department shall meet with the Associate Dean for Academic Affairs and other members of the CALS Administrative Team as appropriate to review the program and its financial status in further detail and report back to the Dean on any recommended actions or revisions.

**Academic Program Review:**
Consistent with CALS and UW policy, the Department is responsible for ensuring reviews of new Master’s programs occur five years after initiation of such programs. Instructions for preparing self-studies and the required governance steps are posted on the APIR website (apir.wisc.edu). Information from Annual Review discussions may, if desired, contribute to the five-year and subsequent reviews.

**Financial Stability of the Program:** In the event that revenue in a given year is not sufficient to cover expenses, the Program will be allowed to carry over a negative balance not to exceed the projected one-year operating expenses. The College expects the Program to generate sufficient funds to cover all operating expenses within the first three years of operation of the Program. If it becomes clear that the Program’s financial situation is untenable, the College and the Department will modify the funding base or, if modification is not possible, close the Program and implement a “teach-out” plan consistent with UAPC policy on program closure/discontinuation. The College will bear one-third of the overall financial losses of the Program; the Department sponsoring the program will need to pay back to the College the remaining two-thirds.

**Use of Program Revenue:** Revenue retained by the Department must be used in accordance with all applicable policies regarding the use of 131 funds and any permanent hires made on these funds must be approved in advance by the College. Revenue provided to the College will first be used to ensure adequate college-level administrative support for revenue-generating programs (such as in Academic Affairs, Business Services, Human Resources, and so forth), to provide funds to seed future Educational Innovation projects, and to cover financial losses of Educational Innovation and revenue-generating programs.

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Kathryn VandenBosch  date  
CALS Dean & Director

Ian Coxhead  date  
Department Chair

Sarah Pfatteicher  date  
Assoc Dean for Academic Affairs

Bill Provencher  date  
REDA Program Director

Angie Seitler  date  
Asst Dean for Business Services