Three-Year Check-In for New Programs

The creation and maintenance of graduate programs and certificates represents significant resource commitments by faculty and staff. Given these investments, in 2014 the Graduate Faculty Executive Committee (GFEC) established a “check in” process for newly approved programs and certificates prior to their first formal university review (which occurs in the fifth year.) Through this “check-in,” the GFEC hopes program faculty and staff will assess the implementation of their new program and determine what mechanisms may be needed for sustained student success.

Progress reports will be included on GFEC agendas, and program representatives may be asked to attend GFEC if additional information is requested. In the interest of brevity, please keep responses to 300 words or less.

Program Name

| M.S. in Agricultural and Applied Economics, named option in Resource and Energy Demand Analysis (REDA) |

Term of First Enrollments

| Summer 2015 |

Check-In Completed By

| Bill Provencher, Bethany Glinsmann, Mary Trelevan |

Date Completed

| June 29, 2019 |

Academic Quality and Student Success

1. Provide an update on any changes to the program’s curriculum and learning outcomes. Include a description of the program’s typical course modalities (face-to-face, online, asynchronous discussion, team or individual assignments) and if courses have evolved based on faculty or student feedback.

Courses in Resource and Energy Demand Analysis (REDA) are offered in a face-to-face format, with the exception of the online summer course (AAE 770). The program consists of 31 credits, an increase of one credit from the initial curriculum of 30 credits. REDA was conceived as a one-year, accelerated program. In response to feedback from applicants, we now offer a part-time option, in which students can complete the program over 2 years. The majority of students enroll in the full-time (one-year) option, but one student enrolled in the program part-time and another student switched to part-time midway through the program.
Beginning fall 2018, REDA is designated as a Master of Science, rather than a Master of Arts. This change aligns with degrees offered by similar programs from peer institutions. Additionally, this change could improve graduates’ job prospects, given that employers have expressed a slight preference for M.S. degrees over M.A. degrees. Also beginning in fall 2018, all of the AAE graduate programs – including REDA – have STEM designation. STEM designation improves our international graduates’ job prospects, due to the opportunity to apply for a 24-month extension to their OPT visa.

Several courses have evolved since the program launched in summer 2015, as described below.

AAE 770: The three-credit course was initially designed as a four week course, but was extended to a six week course based on feedback from students in the first REDA cohort. The extended timeframe creates a more manageable workload and enables deeper comprehension for students. The course was completely redesigned in the fourth year (summer 2018) in response to student feedback and a better understanding of the core concepts needed to progress through the remainder of the program.

AAE 771/777: REDA’s original curriculum included a four-credit modular course (AAE 771), with each one-credit module taught by a different faculty member. Based on student feedback, we converted the course into two separate courses: AAE 771 (three credits) and AAE 777 (two credits). AAE 771 is now taught by a single instructor, which improves course coherence. AAE 777 consists of two one-credit modules taught by different instructors. This change has received positive feedback from students.

AAE 773/721: REDA’s original curriculum included a three-credit seminar course, taught in spring semester. To balance credit load across semesters, the seminar course is now spread across both fall and spring semesters. Writing instruction was incorporated in the original seminar course, but we have since developed a stand-alone one-credit course on professional writing (AAE 721). The seminar is currently taught as a sequence of two one-credit courses in fall and spring semesters.

2. **Briefly explain the program’s learning outcomes assessment plan and discuss how you are or how you plan to evaluate student learning. Summarize any data collected to date showing evidence of student learning.**

The AAE department assesses MS AAE degree program learning outcomes by evaluating data from embedded questions in three core courses, AAE 636, AAE 771/635, and AAE 643. There are plans to assess student writing skills by having the instructor of the new course, AAE 721, evaluate student writing using a rubric.

In the past two years that the department has reported on assessment, 80 to 85% of MS AAE students met or exceeded expectations. When they did not meet expectations, the instructor surmised that the students did not enter the program with quantitative
skills/aptitude as strong as anticipated during the admissions process. The instructors have worked with course TAs to identify early in the fall semester those students who appear to have the greatest difficulty with course material, and to encourage those students to take advantage of faculty/TA office hours and peer-to-peer learning.

3. The GFEC is interested to learn how departments balance faculty and staff teaching loads and responsibilities between new and existing programs. Discuss how the department or program is achieving balance, and what challenges supporting multiple programs may have created for teaching, student services, advising or funding. Also of interest is information on what if any assets are shared between programs, or additional benefits that have been realized.

On balance REDA has not caused significant substitution of faculty effort towards the REDA program.

The only AAE faculty member with an increased teaching load due to REDA is Professor Provencher, who was previously on a 70%-time C-basis appointment prior to the creation of REDA and is now full time (C-basis) in AAE. His additional 30% time is funded by REDA and is dedicated to teaching the REDA practicum courses (4 credit hours total), co-teaching the 2-credit course on survey/sample design (AAE 777) with a faculty associate hired for the course, and teaching a 3-credit course in econometrics designed for professional students (AAE 772).

This year the AAE faculty decided to use AAE 772 as the second course in the department’s 2-course econometrics sequence, replacing AAE 637. Effectively this “frees up” the AAE faculty member formerly teaching AAE 637 to teach a different course.

REDA adds new students to graduate courses that predated REDA, but via the deployment of REDA-funded TAs to these courses the likely net effect is that the instructional load for faculty teaching these courses has decreased due to REDA. In particular, REDA now funds ½-time (20 hours per week) TAs in the following courses that previously did not have TAs: AAE 531, AAE 636, AAE 643, AAE 671, and PA 809.

At the same time, via it funding of TA positions REDA has provided funding for 3.5 AAE PhD students per year.

Finally, REDA hires professionals working in the energy and natural resources fields as faculty associates to teach or co-teach several of its courses, specifically AAE 770, AAE 773 and AAE 777.

With respect to the use of AAE staff resources, the REDA program coordinator handles most marketing, student recruitment and student advising and job placement services.
4. Please describe how your program has ongoing and broad faculty commitment, including governance, to ensure its continued success. If applicable, reflections from faculty and staff can be included here or as an appendix. Also consider if implementation of this program is supporting the Department and/or School/College’s current strategic goals.

With respect to governance, REDA is fully embedded in AAE’s graduate program. The department’s graduate committee makes the decision about accepting applicants into the program, handles all petitions pertaining to course changes and academic probation, and, jointly with the department’s curriculum committee, decides how to configure the REDA curriculum to minimize redundancy in graduate student training. To assure clear communication, the REDA program director sits on the AAE graduate committee.

AAE has had a long and distinguished history in the field of environmental and resources economics (ERE). The AAE faculty in the ERE field recognize that the core of ERE is evolving, and that due to climate change, research and teaching in energy economics is now central to the ERE mission. This is reflected in a recent AAE faculty hire (Johnston) teaching a new undergraduate course in energy economics, as well as the development of REDA.

Ultimately AAE faculty commitment to REDA turns on an obvious benefit and a potential cost. The benefit: the program provides a bulwark against the loss of support staff due to budget cuts, provides TA funding for PhD students, and is expected in the future to generate revenue for other faculty activities.

The potential cost: The undergraduate majors of REDA students are more diverse than that of AAE’s standard master’s students (almost all of whom majored in economics), and so instruction in graduate courses can be more difficult as faculty must manage a greater range of past training without “dumbing down” core material. The initial summer course, AAE 770, attempts to manage this issue by providing the necessary math and statistics training. The availability of REDA-funded TAs also give REDA students the chance to learn necessary background material.

**Operations and Administration**

5. Illustrate how the program has either brought in NEW and ADDITIONAL students (required for non-pooled programs), and/or how overall enrollment in your related programs has remained steady. If unanticipated overlap with existing programs has resulted, discuss steps to mitigate the overlap.

Historically AAE’s graduate program has been heavily focused on the PhD program. REDA has had no discernable effect on enrollments in AAE’s master’s program. Overall enrollment in the AAE MS has stayed in the range of 1 to 6 students per year. In the four academic years before the start of the program, enrollment in the AAE master’s program averaged 4.25 students per year:
In the four years since REDA began, enrollment in the AAE master’s program has averaged 3.5 students per year:

2011-12: 3 MA
2012-13: 6 MA
2013-14: 2 MA
2014-15: 6 MA
2015-16: 6 MA
2016-17: 1 MA
2017-18: 5 MS
2018-19: 2 MS

6. Funding Considerations

a. For traditional/pooled programs – How is the program successfully funding its students?

b. For non-pooled programs – Provide a brief summary of projected vs. actual revenues and expenses. Does the program have sufficient enrollment for sustainability? Discuss the current market outlook compared to the original marketing study, and plans to grow or change the program to become sustainable.

The REDA program proposal projected net revenues of $155,000 per year. However, this number does not align with the budget included in the proposal, as shown in Table 1. Adjusted projected net revenues are $49,094 per year.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$ 439,840</td>
</tr>
<tr>
<td>Expense</td>
<td>$(346,762)</td>
</tr>
<tr>
<td>Net Revenue (stated in proposal)</td>
<td>$ 93,078</td>
</tr>
<tr>
<td>Campus tax (excluded from proposal)</td>
<td>$ (43,984)</td>
</tr>
<tr>
<td>Net Revenue</td>
<td>$49,094</td>
</tr>
</tbody>
</table>

The program has operated at a loss during the first three years, as shown in Table 2.
Table 2. Actual revenues and expenses

<table>
<thead>
<tr>
<th>Program Year1</th>
<th>Revenue</th>
<th>Expense2</th>
<th>Net Revenue</th>
<th>Account Balance</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015-2016</td>
<td>$412,102</td>
<td>$377,239</td>
<td>$34,863</td>
<td>$34,863</td>
</tr>
<tr>
<td>2016-2017</td>
<td>$205,301</td>
<td>$312,176</td>
<td>$(106,875)</td>
<td>$(72,013)</td>
</tr>
<tr>
<td>2017-2018</td>
<td>$366,751</td>
<td>$391,381</td>
<td>$(24,630)</td>
<td>$(96,642)</td>
</tr>
<tr>
<td>2018-20193</td>
<td>$356,216</td>
<td>$382,156</td>
<td>$(25,940)</td>
<td>$(122,582)</td>
</tr>
</tbody>
</table>

1: The REDA program runs from July through June. The program year reflects all revenue and expenses by cohort, regardless of fiscal year.
2: Expense includes UW and CALS assessments.
3: The 2018-2019 program year is currently in progress. Revenues and expenses are projected, not actual.

Applications and enrollments have been lower than projected, as shown in Table 3. The REDA program proposal estimated long-term enrollment of 25-30 students per year, assuming 20 students per year for the first several years. Actual enrollments have been 18, 10, 20, 18, and 6 in the first five years of the program. Furthermore, the program proposal estimated that 50% of enrollments would come from out-of-state students, who paid a higher tuition rate. In the 2018-19 cohort, only 33% of students pay out-of-state tuition. Current levels of enrollment are not sustainable.

Table 3. Number of Applications and Enrollments

<table>
<thead>
<tr>
<th>Program Year</th>
<th># Applications</th>
<th># Enrolled</th>
<th>% In-State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected</td>
<td>N/A</td>
<td>20-30</td>
<td>50%</td>
</tr>
<tr>
<td>2015-2016</td>
<td>31</td>
<td>18</td>
<td>50%</td>
</tr>
<tr>
<td>2016-2017</td>
<td>16</td>
<td>10</td>
<td>60%</td>
</tr>
<tr>
<td>2017-2018</td>
<td>40</td>
<td>20</td>
<td>65%</td>
</tr>
<tr>
<td>2018-2019</td>
<td>30</td>
<td>18</td>
<td>67%</td>
</tr>
<tr>
<td>2019-2020</td>
<td>15</td>
<td>6</td>
<td>N/A1</td>
</tr>
</tbody>
</table>

1: REDA moved to a tiered tuition structure starting in summer 2019.

The program proposal states: “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.” These factors are discussed below.

Since REDA launched in summer 2015, many institutions have launched one-year professional master’s programs in economics or applied economics. While to the best of our knowledge no other such programs focus on energy and resource demand analysis, these programs compete with REDA for applicants.
Interest and support among employers remains strong. Employers are eager to hire REDA graduates, stating that the skills taught in the program meet their needs. For the first three cohorts, REDA has an 88% placement rate in professional positions involving resource/energy analysis and/or data analysis using training developed in REDA.

REDA’s applicant pool is smaller than projected. We attribute this to a marketing problem. Students who are interested in a quantitative master’s program focused on energy and/or natural resources show great interest in the program once they discover REDA. However, the program struggles with a general low-level of awareness among recent college graduates. REDA worked closely with DCS on marketing efforts during the second and third program years, but awareness remains low among our target audience.

7. If the program admits international students, describe how program processes address length of stay visa issues, online course restrictions, and needing ESL services.

On average, approximately 20% of REDA students are international, ranging from 2 to 5 international students per cohort. Thus far, we have not encountered any issues related to length of stay visa issues. Students with visa-related questions are directed to the International Student Services (ISS) office.

Given REDA’s lock-step curriculum, students are not allowed to enroll in courses outside of the prescribed curriculum. The program includes one online course, taught in the first summer term of the program. International student visas are issued for fall term, so international students take the online course from outside of the US.

REDA adheres to the Graduate School guidelines for English language proficiency. We admit students with English skills sufficient for graduate study.

8. Are there any issues impacting the program’s long-term sustainability? If so, what support would you like to help you succeed?

The REDA program is perfectly positioned for training students in economics and data analysis in an exciting societal endeavor: the transition to a carbon-free energy future involving the transition to renewable energy sources, the integration into the energy sector of distributed energy and microgrids, the rise of smart cities, the electrification of the transportation sector, etc. The program motto: “economics and data analysis for a smart green world”.

Undergraduate student interest in how the world transitions to a low carbon future is high. The REDA program has strong faculty support. Employers think very highly of REDA students and over time we are getting more and more inquiries about the availability of students. Students who enroll in REDA obtain outstanding training, get excellent jobs, and join an
active and growing network of REDA alumni (with the first-ever REDA alumni retreat to be held October 2019 at UW’s Kemp Natural Resources Station).

REDA’s long-run survival faces two impediments. The first is that applicants must be capable of completing a rigorous set of courses in economics and statistical analysis. AAE faculty will not allow otherwise.

The other, far more significant obstacle is marketing. Students accepted into the program enroll at a high rate (65% over the first five cohorts; 91% in-state, 46% out-of-state), indicating that once good students find us we have a good chance of enrolling them. But we seem unable to get the program in front of enough potential applicants. We have an excellent program web page (https://reda.aae.wisc.edu/). We’ve tried a number of marketing strategies -- ads on various social media platforms, job fairs, etc. Yet we seem unable to generate the applicant pool necessary to reach our target of at least 25-30 enrolled students per year.