Process Evaluation
Early Results
of the
Industrial Accelerator Program

A Report Prepared for
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Executive Summary

This document presents the results of a process analysis for the early stages (June 2010 to May 2012) of OPA’s Industrial Accelerator Program. The process analysis is primarily based on a document review and interviews with OPA staff, the technical contractor, and executives at a few participating firms. The intent of this process analysis is to provide some early feedback and recommendations and program improvement.

Key findings

Current Status

- As of the end of May 2012, thirty-five of the 45 IAP eligible firms have made at least inquiries about projects. There were 112 project files open. There are currently twenty-eight preliminary studies and 65 detailed studies.

Capital

- The firms that were interviewed had capital or access to capital to develop energy efficiency projects. Capital may be less available to some of the firms that could not yet be interviewed, for example, those in the pulp and paper sector.
- Firms are typically looking for two-year paybacks or less. However, some firms can tolerate longer payback periods. The size of a project and other factors such as the need for replacement can influence payback requirements. Larger projects may require shorter paybacks and the need to replace equipment can result in accepting longer paybacks.
- The availability of capital for energy efficiency projects is time sensitive. It is usually available for a fixed or variable period and if not used within that period can then be used for other purposes.

Incentives

- The size of the incentives being offered by IAP is attractive to the respondents.
- Nearly all of the firms had been considering energy efficiency before IAP although for different reasons. Corporate sustainability issues were driving some. The Northern Industry Electricity Program (NIER) program resulted in some having begun to address energy efficiency. Still others had corporate policies and/or internal committees that were addressing the issue.
- Even so, firms indicated that the incentives provided by IAP motivated them to undertake projects that would not previously have met their payback requirements and caused them to identify some large and previously unknown efficiency opportunities.

The IAP Process

- Respondents identified four areas where the they felt there could be improvements to the IAP Process: the contract, the amount of time and effort spent in the review process, the number of steps in the process, and the need for the process to more closely align with the rhythms of industrial operations.
Contracts

- The length and complexity of IAP contract means project decision-making involves legal counsel, which does not always exist in-house for smaller firms.
- While firms understood the need for OPA to manage risk, most felt that the contract was overly long and restrictive and represented a barrier to some projects or to program participation.
- The 10-year contract period with the M&V and the claw back provision was cited as a deterrent to some projects and to program participation because of changing technologies and future global marketplace uncertainties. Respondents suggested that a period of less than five years would be more acceptable.
- The minimum and maximum levels of savings and the maximum limit on the size of the incentives were problematic for some. The IAP requirements were perceived as too onerous to make qualifying smaller projects worth doing. For a few very large projects, the upper limit on incentives was too low to make the projects meet firms’ payback requirements. It was suggested that the savings levels for micro-projects be raised.
- A more flexible and dynamic program structure that allows project implementation around the capabilities and size of companies and projects is desired.

Technical Reviews

- The technical reviews were perceived as having a one size fits all quality. The amount of technical review needs to be better coordinated with the size and complexity of projects.
- Communication with the Technical Reviewer was perceived to be too formal. Firms would like to interact more informally over the phone to speed the technical review process and avoid project application errors.
- Firms would like more timely information about the status of their project during the review process.
- There was some expression of concern that early technical reviews were not always complete or accurate.

Timing Requirements

- Concern was expressed the IAP program model did not recognize critical timing requirements such as the need to install equipment during scheduled outages and the lead time for equipment purchases.
- The program process also needs to recognize the limited time availability of capital

Other Findings

- Most respondents could provide examples of enabled savings associated with their projects.
- From a marketing perspective, firms are motivated more by productivity improvement and reductions in material waste and energy intensities than “energy efficiency” per se.
- Non-energy benefits such as improved product quality and purity, reduced material consumption and maintenance costs, and reduced environmental emissions, were important to firms as well.

Recommendations

- The upper limit for incentives be reviewed and raised if possible to allow for larger projects.
• The savings limit associated with micro-projects be raised substantially to facilitate a simpler process that does not require a detailed study for projects like air compressor projects, or a graduated scale of incentives and requirements be instituted that would allow firms to select a level of incentives and paybacks with which the firm is comfortable.

• A concerted effort be made to reduce the bulk of the contract to perhaps 15 to 25 percent of its current size and to make the language clearer.

• The length of the contract and the monitoring period be reduced to the calculated payback period for the measure without incentives or a fixed period such as five years.

• Further efforts be made to coordinate the level of effort for the technical reviews with the size and scope of the projects. Perhaps a cap on the level of effort of the technical review process should be placed on projects costing less than $100,000. The budgets for technical reviews should be related to the opportunity to significantly reduce error bands and the size of such reductions. Technical Reviewers should quickly identify alternative evaluation methods and choose a method that produces acceptable results in relative and absolute terms at least cost.

• More communication such as a project initiation meeting, site visits, telephone and e-mail communication are needed to facilitate and speed technical review.

• Make the process more responsive to timing requirements and information needs of participants by use of management software with automated e-mail notification and calendar items.

• Establish a critical timeline worked out among representatives of the firm, the KAMs, and the Technical Reviewers when the project is initiated. The timeline should be based on critical factors such as the availability of capital, the timing of maintenance outages, and purchasing requirements.

• OPA processes and approvals should meet the timeline established by the KAM and the project manager.

• Consideration be given to providing a notice of intent to award a contract from OPA to participants that could be issued well in advance of a formal contract to provide more flexibility in initiating projects.
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1. Introduction

This is a process evaluation of the Ontario Power Authority’s Industrial Accelerator Program (IAP). The Industrial Accelerator Program targets the Ontario Power Authority’s transmission connected industrial firms. The goal of IAP is to increase the efficient use of electrical energy and reduce the energy intensity of industrial plants in Ontario. The mechanism to accomplish this is to provide financial incentives for efficient equipment upgrades and process system improvements so that the rate of return for major energy efficiency projects is competitive with other investment opportunities that firms have.

The IAP has several elements. IAP provides funding for two levels of engineering studies, preliminary and detailed. Preliminary studies allow firms to scope the opportunities within their facilities to assess the range of potential of projects and/or to identify projects that have promising paybacks. Detailed studies are designed to provide a more detailed investment grade analysis to support the business case for an energy efficient investment. A firm can apply for incentives to support a preliminary and/or detailed study or they can complete these studies on their own.¹

A detailed study plan is attached to a Project Incentive Application and a measurement and verification plan. When OPA accepts the incentive application after a technical and financial review, and the firm receives and accepts the agreement documentation, the firm can commence implementation. Projects must be installed within two years. The firm must comply with the measurement and verification requirements and submit quarterly monitoring reports during the first year after the in-service date and annual reports thereafter over the length of the incentive agreement.

Firms may also complete micro projects. These are projects that produce annualized electricity savings between 100 and 700 MWh and do not require a detailed engineering study. As the name implies micro-projects are limited to projects that produce less savings.

A parallel OPA program, the Process and Systems Upgrade Initiative (PSUI), is conducted under OPA auspices by Local Distribution Companies in Ontario and targets distribution connected industrial firms. The PSUI program is very similar to the IAP program although it is marketed by the LDCs rather than OPA Key Account Managers and includes energy manager and roving energy manager elements. Generally, the industrial transmission connected customers are among the largest users of electricity in Ontario although there are some firms that are large users of electricity that are distribution connected. A few firms with multiple facilities have some facilities that are transmission connected and others that are distribution connected.

1.1 The Goals of the Process Evaluation

In 2011, OPA contracted with ADM/Innovologie to conduct process and impact evaluations for both the IAP and PSUI program. The evaluation got underway in November 2011 although some preliminary work was done in the spring of 2011. One IAP project was completed in 2010 and another in 2011 and impact assessments of those projects have been completed.

¹ The maximum incentive for a preliminary study is $10,000. A detailed study may be fully funded for the first year.
The process analysis was initiated in November 2011. The goal of this process evaluation is to:

- Establish an early baseline understanding of program operations,
- Provide early feedback about the operations of the IAP, and
- Provide recommendations for process improvement.

A separate report details findings for the PSUI.

1.2 The Scope and Methods Used in this Evaluation

This report is based on several sources of information including:

- Information obtained from the OPA website
- Documents downloaded from the OPA website and other sources,
- Interviews with OPA staff responsible for managing the IAP program,
- Interviews with three members of the Technical Review staff (Willis Engineering),
- Interviews with the four OPA KAMs,
- Reviews of preliminary and detailed studies, and applications in the CRM and Willis Engineering tracking systems,
- Interviews with eight firms that are participating in the IAP program, and
- An interview with a responsible party at the Ministry of Energy.

A more in-depth process analysis of the program will be completed later in the life cycle of the program.

Open-ended in-depth interviews of the OPA and Willis staff were completed in November of 2011. The interviews were based on interview guides constructed after a review of the available program documentation. These interviews focused on:

- The roles of the respondents,
- How operations were structured,
- How operations had changed and were expected to change,
- The effectiveness of operations and the program to date, and
- Recommendations for changes to the program.

The interviews were conducted face-to-face in a conversational style taking from 45 minutes to an hour and a half. The open-ended nature of the interviews allowed for immediate follow-up of points raised. The interview guides helped to ensure that there was consistency in the content of the interviews.
The interviews with the OPA KAMs and representatives of the firms were conducted by telephone in April and May of 2012. These interviews were also open-ended in-depth interviews based on an interview guide. The interviews with the KAMs focused on:

- How they marketed the program,
- The response of the industrial firms to the program,
- The operation of the program,
- Recommendations for program improvement, and
- Detailed information about specific firms to be interviewed.

The interviews with the participating firms covered:

- The importance of energy efficiency prior to exposure to IAP,
- How the firm became involved with the program,
- Project identification,
- Projects for which an application for a study or incentive had been made,
- Decision-making surrounding the projects,
- The likelihood that the projects would have proceeded without IAP or were accelerated by it,
- The progress of the projects,
- Benefits and challenges in dealing IAP,
- Recommendations for program changes.

The firms with which interviews were conducted represented a purposive rather than random sample. The firms were selected because they had completed or were in advanced stages of implementing projects. The size of the projects ranged from smaller projects (175 MWh) to very large projects. Firms represented different industries including; cement, steel, wood products, petrochemicals and mining were interviewed. The target technologies included compressors, fans, control systems, variable speed drives, fluid pumps and process improvements involving heat transfer.

2. The Program To Date

Based on information in the Willis Energy tracking system at the end of May 2012, thirty-five of the 45 eligible firms have made at least an inquiry about a project. There are 112 project files open. Twenty-eight of these were for preliminary studies and 65 for detailed studies.

3. Program Logic Model

The purpose of the program logic model is to provide a description of the program and the program logic. It serves as a baseline from which changes to a program can be determined and it provides a logical framework that can be used for program analysis.
A logic model is two-dimensional. One dimension, in this case the horizontal, summarizes the logical progression of a few key program activities. The second dimension summarizes the logic of the activities, the outputs of the activities, collaborators in the activity, the target audience for the activity, near-term outcomes, and long-term outcomes or impacts associated with the activity. In our terminology, outputs are the results of the program activities. Outcomes are what partners and participants do in response to program outputs. The model also identifies external factors that may influence the outcomes of the program.

3.1 Program Activities

The logic model for the IAP program (see the attached Figure 1) identifies seven activities:

- Develop OPA infrastructure
- Outreach and enrollment of industrial firms
- Approving applications for studies
- Approving studies and incentive application
- Implementing projects
- Monitoring and verification
- Reporting

3.2 Program Outputs

The OPA infrastructure development activity produces a number of outputs including program goals, a program design, a budget, an organizational structure, workflow management, contract templates, and other results that facilitate program delivery. Outreach activities are designed to recruit industrial firms, contractors, and vendors to the program. The principal marketing activity for this program is the one-to-one contact between the KAMs and the industrial firms. Written and other communication activities support the work of the KAMs.

The program is designed around studies that are used to support incentive applications. Firms can conduct their own preliminary and detailed studies or they can apply for a preliminary or detailed study grants. The can also bypass the preliminary study and start with the detailed study and in some cases the incentive application. The program reviews the application for the study grants and then approves them. The firms and their contractors or vendors can then conduct the studies that are approved by the Technical Reviewers and OPA. The firm then submits an incentive application that is approved by the Technical Reviewer and OPA and the firm is provided with a monitoring and verification plan. The industrial firm and its contractors then implement the projects.

Projects are subject to monitoring and verification. Installations are verified and data collected by the participants is monitored for compliance with the goals the incentive application.

Finally, there is reporting and evaluation, for example, this program evaluation and the annual impact evaluation report.
3.3 With Whom and for Whom
Activities are frequently conducted with partners and they are targeted to specific audiences. For example, the enrollment activity is targeted to industrial firm managers and to a lesser extent to vendors and engineering firms that may influence them and help to recruit industrial firms. Contractors, vendors, and engineering firms can all assist participants in preparing applications for studies, studies, and incentive applications.

3.4 Near-term Outcomes
Near-term outcomes are the immediate responses of participants to OPA activities. In this program, the near term outcomes are program awareness on the part of industrial firms, increased awareness of efficiency opportunities, increased knowledge, applications for studies, the production and completion of studies in concert with engineering firms and vendors, and the implementation of projects. Each of these general outcomes is a result of a series of much more specific activities. For example, implementing a project requires hiring a contractor, completing an engineering design, ordering the equipment, scheduling the installation, installing, and commissioning the equipment. Failure to complete some or all of these steps can result in the failure of the project or a project that does not produce the expected savings.

An outcome of the monitoring and reporting activities may be changes to the program and policies undergirding the program.

3.5 Long-term Outcomes
The near term outcomes produce additional activities and should result in the long-term outcomes (impacts) that are desired by the program. The desired long-term outcomes from this program are reductions in kW demand, consumption (kWH), and energy intensity. However, there are other long-term outcomes for participants. The program may result in reduction of labor inputs, reduction in emissions, improved operational efficiencies, improved product quality, reduced costs, improved profit margins, improved global competitiveness. Some of these long-term outcomes also represent larger societal benefits such as reductions in emissions and maintaining jobs and industries.

In addition to these benefits, companies may replicate projects in the same or other facilities. Competitors may emulate these activities producing even more savings.

Finally, the projects may produce new and refined practices (best practices), more sophisticated engineering and industrial firms, increased clean energy knowledge, and better global business strategies.

3.6 External Factors
There are external factors that may influence the program. A global recession could make it difficult for some companies to participate. A rise or fall in electricity prices could encourage firms to be more or less attentive to energy efficiency. Another factor might be change to cash flows from the Global Adjustment Mechanism. Legislation could change how the program operates, the terms of participation, or policies that make the program more or less attractive, for example, emissions criteria or carbon credits. Global business strategies may influence companies to invest or not invest.
4. Perspectives on IAP Program

Most of participating customers with whom we spoke were positive about the program although there were different assessments of the value of IAP for different projects based on the size of the projects and the cost and difficulty of meeting program process and technical review requirements. One respondent expressed the view that his firm almost needed a full-time person to deal with the OPA bureaucracy. Another commented that the paperwork process for IAP is long and rigorous. Yet, another respondent said that the firms just did not have the time or resources to work through the IAP bureaucracy and requirements.

Based on their comments about their initial experiences, the evaluators believe that most firms are likely to be more selective choosing only larger projects because of the detail required and the cost of obtaining it. Further, most respondents would recommend changes to the incentive caps and limits associated with the program although there was no unanimity about which caps and limits or the amount of the changes. At least one firm said that they have some very large projects that would produce very large savings that do not qualify because they exceed the upper limits and the buy down from the incentive is then not sufficient for the projects to meet the hurdle rates. Some suggested that the lower limits need to be increased for IAP and the upper limit of micro-projects raised to allow more small-to-medium sized IAP projects to fall into the micro-projects category, because micro-projects are smaller and have fewer paperwork requirements. This would assist in balancing the administrative costs of doing projects against the benefits. Most respondents commented on the need to reduce requirements and streamline the program process and the technical reviews. The real issue is to make the requirements scale with the complexity and benefits from projects. Respondents support the program and want it to continue albeit with modifications.

4.1 Capital and Paybacks

The firms that were interviewed indicated that capital for energy efficiency was available although efficiency projects were not necessarily the most visible or the most likely projects to be funded. There are industrial firms that were not interviewed in this round where capital may be somewhat less available, for example, firms in the paper and pulp sector where demand for paper, especially newsprint, has declined in recent years. When they are interviewed in later rounds of the evaluation they may have a different perspective on capital, their ability to fund projects, solvency requirements, and incentives.

Respondents indicated that in general their firms would move forward with projects that had two-year paybacks or less. One respondent observed that the firm’s VFD project would not have moved forward because it had a payback of 4.5 years. IAP reduced the payback to 2.5 years making the project possible.

Firms will sometimes consider projects with longer paybacks. One respondent reported that his firm could sometimes undertake projects with paybacks of four years.

The size of a project may also influence the hurdle rate. A respondent observed that in their firm it was easier to get capital for smaller projects than larger ones because smaller projects absorb less capital. He said that as the cost of the project increases, the payback must move closer to one year.
One of the respondents pointed out that in large multi-facility and multi-national firms, the availability of capital varies from year to year. A project that can be funded in one year might not be funded in the next given the available capital and the competition across the larger portfolio. In other words, the payback threshold is variable within a firm and across time.

At any given time managers are likely to have a good feel for what projects can be funded and which cannot. One manager says that in order to maintain their credibility, they are very careful about pursuing projects that he thinks are unlikely to be funded.

Capital availability has a “lifetime.” Capital may be tied to a specific budget year requiring that it be expended within that year. Alternatively it may be available for some period of time, say six months, but if not used within the time frame it may be reallocated to another project. Further, such timeframes are not necessarily fixed and the availability of capital may change based on other needs and projects. The key takeaway here is that projects that have received capital budgets need to be initiated right away in order to preserve the capital.

4.2 Incentives

Energy projects must compete with non-energy projects for capital funding. Even if an energy project is competitive firms may give higher priority to non-energy projects related to the core business, emissions, or safety requirements. Typically, emissions and safety requirements are accorded the highest priority although the associated paybacks may be less.

As reported by the respondents, incentives were of sufficient size to interest companies to look for and initiate projects. As one respondent put it, “we really like the benefits of IAP from OPA.” A number of the respondents reported that the incentives improved the payback on previously identified projects so that the projects were competitive and could receive capital funding. When the program was announced, several respondents said that their firms identified new projects and assessed their potential. Respondents also reported that they examined and rejected projects that could not meet internal hurdle rates even with the incentives. Most firms suggested that were pursuing a mix of previously known and newly identified projects.

4.3 Projects Would Not Have Been Completed in the Absence of the IAP

The process analysis for this report was not intended to assess net-to-gross issues. Nonetheless some of the questions elicited responses about what would have happened in the absence of the program. One respondent reported that a VFD project with a 4.5 year payback would not have been implemented without an IAP incentive that bought the payback down to 2.5 years. Another firm reported that due to the high level of IAP incentives, it is now pursuing energy efficiency upgrades that it had previously by-passed. Finally, the program has helped firms identify projects that companies had not previously thought of and that do not receive IAP incentives. One firm reported a compressor project with a nine-month payback that is being done in house. Most of the respondents could identify projects or aspects of projects such as the one that was just mentioned that resulted in enabled savings.

4.4 Motivations for Participating

Energy efficiency is not new to many of these companies. One respondent said that their company had created an in-house energy conservation team in 2007. Another firm has what
was described as a Euro-centric green agenda wanting to reduce emissions and do waste recovery for co-generation. One respondent reported that energy conservation is a corporate directive. Most have energy managers whose responsibilities include at least some conservation related activities. Some firms were already addressing efficiency because of the Northern Industrial Electricity Rate (NIER) Program operated by the Ministry of Northern Development, Mines, and Forestry.\(^2\)

One firm reported that it looked at ISO 50001 (a standard for improving the energy intensity of facilities) and decided to follow the procedures but to not register because of the cost. The ISO standard calls for a systematic approach to energy efficiency. Most firms had elements of what would be required under ISO 50001. In general, firms are motivated more by productivity improvements and reductions in material wastes and energy intensities; and less so by “energy efficiency.”

### 4.5 The Program Process

As noted earlier, the general customer reaction to the IAP process is that it is overly detailed and cumbersome and that it would benefit from being streamlined. For example, one respondent who had completed a small project said that if he did more projects he would only do larger projects because of the amount of detail. However, the range of responses was much more nuanced than this summary statement implies.

#### 4.5.1 Project Selection

The firms that were interviewed for this report were among the early participants and nearly all indicated that they were looking at some aspects of efficiency prior to IAP. Some had participated in earlier OPA offerings. One respondent reported that when the IAP was announced, they went through a process with their business units to identify projects and that was a major in-house effort. Another firm has an internal committee that was looking for opportunities. Some hired outside contractors to examine their plants.

Everyone that was interviewed understood that ratepayer funds were being used and that accountability was important. At the same time, nearly everyone felt that the process could be simplified and made less time consuming. The main problem appears to be that the process has a fairly fixed structure and set of requirements that do not mesh well with variations in the size and capabilities of companies and the size and complexity of the projects that are being undertaken. OPA would be better served with a more flexible and dynamic structure that can be implemented around the capabilities and size of companies and projects. One respondent described the current rigidities in the process as a combination of the requirements imposed in the enabling legislation and OPA’s use of rules and procedures to deflect and minimize financial and other risks from OPA and OPA staff.

There were several aspects of the process that were identified as being problematic:

- The complexity of the contract,
- The amount of time and effort expended in the technical review process,
- The number of steps in the process, and
- The need for industrial firms to move expeditiously,

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\(^2\) The NIER program provides an electricity rebate for firms in selected industrial sectors in Northern Ontario that develop and implement Energy Management Plans (EMPs).
4.5.2 The Contract

There was substantial commentary about the incentive contract. The contract is approximately a 100 page document. One respondent made the point that an executive is unlikely to read such a document and will refer such documents to legal counsel for advice. For firms that do not have internal legal counsel, this means hiring external counsel. For some, the size and complexity of the document represents a cost and a potential barrier to participation. One respondent said the legal burden is too high to make small projects worthwhile. Another respondent observed that the length of the contract and getting it vetted by lawyers resulted in a two to three month delay.

The legal document was perceived as being well written. One respondent reported that his internal counsel was admiring of the craftsmanship of the contract. At the same time this counsel warned that almost all of the risk was deflected from OPA and assigned to the participant. Further the counsel had concerns about some of the clauses.

Most of the participants reported that their legal counsel had identified issues with the contract. Once respondent said that their counsel had identified 18 separate issues. Others indicated at least a few issues. In the end, most respondents said that their firm agreed to sign the contract although most expressed discomfort with some of the provisions. OPA would not agree to contract modifications.

The most contentious point was the 10-year contract term with a claw back provision. When the project goals are not met, the claw back provision allows OPA to recover some amount of the incentive. One firm has determined it will not participate in IAP because the length of the monitoring and verification procedure. In this instance Board approval was required to enter into such a long contract. Another observer pointed out that that a monitoring and verification period of that length makes little sense because companies expect too many changes and uncertainties to their production processes resulting from changing technologies and global markets over 10 years.

For IAP, but not PSUI, the evidence suggests that firms are accepting the 10-year contract. To large multi-facility and multi-national firms, the value of the current incentive at the local level is substantial. In the grand scheme of things having to pay back some of the incentive in the future would not be a welcome event but would not necessarily represent a major problem. This is not necessarily the case for small industrial firms who are likely to participate in PSUI.

In the interviews, it was not clear to the evaluators whether the respondents understood the linkage between the size of the incentive and industrial electricity rates. This is something to be explored in the next iteration of the interviews.

The 10-year contract may also become a limiting factor in the projects that firms choose. It may encourage firms to choose projects at the core of their processes or in areas where physical changes are generally less likely over a ten year period bypassing projects that might generate greater savings but where the likelihood of changes in equipment or process may occur on a shorter cycle that would subsequently diminish savings. One respondent said that the length of the contract needs to align with the likelihood that the industrial process will change. This respondent went on to say that if the project is focused on an element within a process and that if the element could change then the contract may need to be of shorter duration. If the project is tied to the overall process and that process is likely to continue,
then the contract could be longer. Another respondent stated the same thing in a slightly different way, “shorter payback periods should correlate with shorter monitoring and verification periods.” He then said that a two to three year monitoring and verification period is much better than a 10-year one with a claw-back provision. Finally, another observer noted that most firms want the monitoring and verification period reduced from ten years to two or three years.

It was also noted that the contract terms are asymmetric in the sense that a firm is penalized for a project that underperforms but there is no benefit for a project that outperforms expectations, except of course, for the reduction in energy usage.

The evaluators note that the monitoring period and the claw back provision is among the most stringent that the evaluators have seen. In some instances, utilities in other jurisdictions require the verification of the installations and perhaps commissioning. Some require one or two years of monitoring and verification. In other instances, the term of the contract may be the payback period without the incentive for the project or a fixed period usually of less than five years in duration. Some utilities have claw back clauses but most do not. ESCOs, energy service companies that identify projects, provide capital, and monitor the results, usually do not consider projects with more than a seven-year life.

It is the view of the evaluators that this provision needs to be re-examined and the contract life changed if possible especially when dealing with smaller firms. There are two issues. One has to do with maintaining monitoring and verification over a ten-year period. This is discussed in more detail below. The essential question is whether monitoring is continuously needed over the time frame or whether at some point one just verifies that the equipment is operating in its initial configuration.

The other issue has to do with the size of the incentive. The incentive of $230/MWh appears to be contingent on a “measure” that is to provide benefits over ten years. An incentive of that size is very substantial. By comparison incentives at other utilities are often in the range of $20 to $50 MWh, which implies that incentive assumes benefits for two to five years even though the benefit stream may continue for years beyond that.

It might be useful to examine whether the physical configurations of industrial systems are stable over ten years and whether that will continue to be the case in the future. The stability of industrial systems may be of shorter duration than is generally believed.

A key question is how large the incentives need to be to motivate industrials to undertake efficiency projects. It may be useful to examine the costs and paybacks presented in detailed studies submitted to IAP to assess the need for a ten-year contract. Such a review might suggest that a lower incentive would work as well. A third alternative is to tie the incentives to contract length. Firms could choose a contract length and incentive level that works for them. The contract terms could be less stringent for lower incentives. In one sense, this is what the micro-projects do.

4.5.3 Carbon and Carbon Credits

Although respondents were not asked about carbon credits directly, the subject of carbon credits did arise in relation to the contract during the interview with one firm. At the present time there is not an active carbon market in Ontario. The IAP rules state that any carbon credits that might be received retroactively are to be assigned to OPA. Presumably the
rationale for this rule is that the project would not have occurred without OPA funding and therefore OPA is entitled to the entire amount of the credits. The respondent indicated that his firm was not in agreement with the IAP rule. The respondent expressed the view that carbon credits should be shared on the basis of the relative proportion of capital invested by the two parties. The firm still signed the IAP contract because there is currently no consequence with respect to carbon credits.

Utility efficiency programs in other jurisdictions vary in how they handle carbon credits. Many do not yet address the issue. Some take all of the credits, some apportion the credits, and some assign the credits to the customer or the vendor. This is currently not a major issue in the circumstances of this program but it may become important and likely needs to be reviewed and addressed in the future. OPA might consider options such as taking the credits and investing their value in efficiency programs above and beyond regularly funded programs. Another alternative might be to allow the firm to retain the credits if they are used to buy down new projects so that they have a payback between one and two years. This would provide an incentive to continue to do projects.

4.5.4 The Technical Review Process

A number of issues were raised with respect to the amount of time and detail involved in the technical review process.

4.5.4.1 Communication with Technical Reviewers

At the beginning of the program, some firms experienced communication issues with the technical review team. The communication issues occurred when the technical review team sent formal data requests to participants to clarify participant studies or proposals. In at least some instances, the data requests were unclear to the firms causing confusion or the request reflected a technical misunderstanding of aspects of the project resulting in data requests that did not make sense. The crafting of a response and the exchange of e-mails caused the process to take longer than it might have. Some of these same respondents said that the communications problems could have been avoided through telephone conversations, early proposal meetings to discuss the projects, on-site visits to understand the field situation, and/or informal review before the proposals are submitted. One respondent observed that the process would have moved faster if his firm had been allowed to directly interact with the Technical Reviewers over the telephone.

The evaluation team understands the need for formal communications to document requests and issues with the analysis. However, these can be completed as a matter of record and should not necessarily be used as the method of communication to clarify technical issues. One respondent reported that working with the technical review team had gone smoothly as a result of telephone conversations, a report briefing, and an on-site visit.

The communication issues may be related to program start-up and may be being mitigated. The process that is currently followed with new projects appears to be somewhat more fluid. If it is not already the case, the evaluation team recommends that the standard procedure be that a teleconference or on-site briefing be held when a customer or the customer’s engineering firm submit a preliminary or detailed report or an incentive proposal. In addition, it is recommended that telephone conversations or conference calls be used to request information and answer questions prior to formal data requests. Finally, it is recommended that when projects are large, and/or complex, and/or the application and/or the environment
in which the application is to be installed is unique, that Technical Reviewers conduct site visits, perhaps in conjunction with a report briefing. Not every project warrants a site visit. The Technical Reviewer, the KAM, and a representative of the firm should assess the potential value of a site visit when a detailed report or incentive application is being submitted and conduct one if there is value in doing so. The evaluation team believes that site visits are important to ensure quality work but at the same time is cognizant of the costs of site visits so that the decision to conduct a site visit should be well considered.

4.5.4.2 The Optimal Level of Technical Review

Different respondents also commented on the detailed nature and the amount of time involved in the technical reviews, the requests for information, and the detail of the review. One respondent commented that the cost of the analysis was almost equivalent to that of the installation cost. Based on our discussion with the technical review team in November 2011, the technical review team is well aware of these concerns and at that time was attempting to adjust its procedures to align them with the size and scope of the projects.

One respondent commented that too much effort is expended in trying to reduce the error in estimates by small amounts. From an overall perspective, larger percentage errors for projects with smaller savings can be tolerated more easily than larger percentage errors for projects with larger savings. Further, because errors tend to be both positive and negative, errors may cancel out over a large number of smaller projects.

The key factors influencing the error band around the savings estimates are: the operating hours, load factors, and the engineering methods used. It is likely that most of the error in estimates of savings arise from the first two factors although differences in engineering methods can also affect estimates of savings in some instances. Before doing more detailed analysis, the technical review team may want to do some sensitivity analyses to assess whether a more detailed analysis will produce results significantly better than those of a more simple analysis.

4.5.5 The Monitoring and Verification Process

IAP requires that there be a monitoring and verification (M&V) plan and that M&V be conducted following installation of equipment and changes to processes. Post installation monitoring consumption is to be compared to the pre-program production consumption baseline. Firms that have submitted an incentive application have had interactions with the Technical Contractor in regard to M&V plans. There was not a great deal of discussion about M&V during the interviews. However, projects are just reaching a stage where the post installation monitoring is beginning so that there is not yet enough experience to know how the monitoring and installations requirements might play out.

Most respondents understand the need for M&V and appreciate the fact that the M&V results will provide tangible proof of the savings. However, similar to their concerns on the duration of the ten-year contracts, respondents also indicated that a ten-year monitoring period was excessive. Some expressed the notion that two or three years of monitoring are sufficient.

One concern is that process systems are dynamic and that over a period of years the configuration of the industrial system may change causing changes in consumption at measured points that are unrelated to the changes instituted as a result of IAP and that are not consistent with the measurement of the original baseline. Another respondent observed
that data collection over a period of ten years at one-minute intervals would result in very large amounts of data causing data storage and management issues. It is not clear whether the customer M&V plans are designed with practical considerations such as these in mind. It should also be noted that there is some disagreement within the technical community about the appropriate metering intervals.

A monitoring strategy is to isolate and then measure consumption in those parts of the system where changes will and have occurred so the impact of the changes can be understood. Some respondents discussed meter placement arguing that they were not always in agreement with the Technical Reviewer about the placement of the equipment. In one interview, the respondent pointed out that the equipment could be moved and that in those circumstances it made more sense to monitor at the circuit rather than the equipment level. This suggestion had been made to the Technical Reviewer but was not accepted.

4.5.6  The Accuracy of Technical Reviews

There was also some comment about the accuracy of some of the technical reviews. One of the KAMs commented that the Technical Reviewer did not always produce satisfactory reports. There was also concern that the Technical Review team did not always understand the industrial process and therefore their reports were not complete or not accurate. This circles back to the earlier discussion about communication and site visits. In order to prevent repeated requests for information, the process needs to have some less formal and more rapid feedback loops. The evaluators understand that there may be concerns that direct contactor-participant communication might lead to possible bias but the integrity of the process is also compromised when the information flow is not adequate. In the view of the evaluation team, the latter problem is probably more serious than the former. The independent review of the evaluation team should address any concerns about the independence of the Technical Reviewer. The evaluation team recommends more rather than less communication in this area.

4.6  The Importance of Project Timing

As part of doing business as usual, firms are used to identifying projects, doing the engineering, allocating capital, and implementing projects. Several respondents observed and commented on the fact that the IAP rules represent and additional set of constraints that can influence the timing of the projects. One respondent said that his firm really liked the benefits of IAP but that OPA needs to speed up the program process to be successful in the future. To paraphrase another respondent; back and forth, hurdles and delays with OPA made it take two years to get a project implemented. By comparison, we did a project with our natural gas company that took two months.

“Timing is crucial” for project success. Activities that are critical to timing include:

- Installation during downtime or maintenance periods
- Equipment purchases; and
- Capital allocation

4.6.1  Installation During Downtime or Maintenance Periods

A key driver of project timing is downtime or maintenance periods. The cost of stopping and starting large-scale processes that operate 24/7 can be substantial. The largest costs can
be the revenues from lost production. Thus firms with continuous processes schedule maintenance at regular intervals and keep the amount of downtime to the absolute minimum. There are a number of variables that influence the timing and length of maintenance.

The need to maintain continuous processes mean that downtime and maintenance typically occur on a quarterly, semi-annual, annual, or biennial basis and are of the shortest possible duration. Unless changes can be made without disrupting the process, the installation of efficiency equipment and process changes must occur during downtime and maintenance periods. This means that efficiency installations must be scheduled and in some cases staged across multiple maintenance periods. If installations cannot be scheduled during downtime they are either postponed or dropped. At the same time, firms have strong incentives not to postpone the installation of capital investments because that means the capital is sitting idle when it could be earning a return.

4.6.2 Equipment Purchases
A second constraint on timing is equipment purchases. Much of the equipment that is used in process efficiency projects is special order equipment. In some instances the equipment is custom designed for the facility. The time between ordering equipment and its delivery can be three to six months or more. Firms must be assured that a project is going to move forward before equipment is purchased. This means that equipment purchases must be backed-up from the installation date with some room for delays.

4.6.3 Capital Allocation
A third constraint is the availability of capital that was discussed in an earlier section. Some firms need assurance about the amount of an incentive that they will receive before they will allocate capital. The signed contract is an important milestone.

As noted earlier, a further constraint is that capital has a “lifetime” and typically must be spent within a time frame. Thus, timing is important here as well. One respondent noted that company funds earmarked for projects can expire during a budget year because the OPA’s IAP approval process takes so long. Another made a similar point when they remarked that the longer the IAP projects are delayed the tougher it is to hold onto the internal capital that is allocated for projects.

4.6.4 Program Implications
The implication of the preceding is that OPA needs to examine its processes to make them more responsive to the timing requirements of the participants. One of the KAMs reported starting with the installation date and then working backwards with a customer to build a schedule of OPA’s activities that would meet the customer’s needs. The customer praised the KAM for having facilitated the process.

KAMs may already be doing this, but perhaps, the process should be more formalized for all projects or at least for all projects for which delays might have substantial consequences. As projects enter the system or even before, the KAM might work with the customer to identify the activity and the timing of OPA activities and schedule them with the appropriate OPA functionaries and contractors. This might be done with project management software with automated e-mail notifications and calendar items. A request from one of the respondents was that they receive regular e-mails updating the status of their applications. Perhaps these needs could be tied together to enhance the process and communication between
customers, OPA, and technical staff, and internal communications for all three groups as well.

This would also help to identify when resource constraints at OPA might need to be addressed. The evaluators are of the impression that the decision-makers are limited to a few key people at OPA whose absence, or whose attention might be focused on other matters. This can lead to delays. Such a system would support the ability to look forward to decisions and also to provide backup to the key decision-makers when crucial decisions are pending.

An additional issue with regard to timing is the requirement that customers not purchase equipment until they have a signed contract. OPA’s concern appears to be the appearance that advanced purchase of equipment indicates that the customers could have completed the project on their own without OPA assistance (e.g., free-rider). An additional concern is that until the incentive is proffered, its value might change, or some additional factor might disrupt the outcome.

OPA may want to consider a notice of intent to award an incentive, which might provide a minimum incentive value along with notice that a contract is being put in place and a date that the contract might be awarded. The letter might also note any circumstances that might disrupt the award and let the firm assess the risks of moving forward. This could facilitate firms’ purchase of equipment early enough so that it is available to meet scheduled maintenance downtimes.

4.7 Key Account Managers (KAMs)

The participants were very complimentary of the efforts of the KAMs. They reported that the KAMs were very helpful in negotiating the thicket of requirements. As one respondent put it, “the KAMs did a good job of meeting our timelines in order to install equipment.”

4.8 Enabled Savings and Non-energy Benefits

Respondents were asked about enabled savings, energy savings that occur because IAP had not previously been identified, or actions leading to savings that were not anticipated and/or not calculated as part of a project report. In addition, projects may have other non-energy benefits.

Most of the respondents were able to identify both enabled savings and non-energy benefits. One of the respondents described a compressor project that was discovered as a result of the investigation of their plant in preparation for detailed studies that they are doing on their own because the payback was nine-months. The enabled savings typically resulted from enhanced understanding of processes as a result of the projects and enhanced used of process controls that were installed as part of the projects. For example, the use of variable speed drives to throttle the process as needed reduced overall consumption but it was also discovered that fans could be reprogrammed to run at 80 rather than 100 percent of speed during certain portions of the process and still maintain the efficacy of the process. This was not anticipated in the detailed analysis. It is likely that many projects will have similar outcomes and that these can be more thoroughly analyzed during the impact evaluation.

Several of the respondents also discussed non-energy benefits. One respondent pointed out that in addition to reducing electric energy consumption through the reuse of waste heat, the revised process resulted in a product that had fewer impurities resulting in a higher quality
and potentially more valuable product, although the respondent was not committal about the improved value of the product. In another instance, the respondent reported that electrical efficiency improvements to the process allowed the firm to reduce the amount of biomass it burned and that in turn, reduced its need to buy additional biomass. And in a third instance, the switch from desiccant to refrigerant dryers resulted in reduced maintenance costs. A further benefit is reducing various forms of emissions from the plants into the environment assisting in complying with environmental regulations. These examples of non-energy benefits support the more general observation that electrical (or any other fuel) efficiency projects often have significant other benefits for both the firms involved and society at large.

Firms do not generally track these enabled savings or non-energy benefits. A first step in tracking these is to know what the benefits are. Firms are frequently aware of them. The evaluators would suggest the addition of a section to the incentive application in which firms are asked to identify additional savings and benefits that they expect to see. In addition, it is suggested that there be a section in the quarterly and annual savings reports that identify such benefits. For IAP, the KAMs might then work with the firms to make an initial attempt at quantifying these benefits.

5. Findings and Recommendations

This document presents the results of a process analysis for the early stages (June 2010 to May 2012) of OPA’s Industrial Accelerator Program. The process analysis is primarily based on a document review and interviews with OPA staff, the technical contractor, and executives at a few participating firms. The intent of this process analysis is to provide some early feedback and recommendations and program improvement.

5.1 Key findings

5.1.1 Current Status

- As of the end of May 2012, thirty-five of the 45 IAP eligible firms have made at least inquiries about projects. There were 112 project files open. There are currently twenty-eight preliminary studies and 65 detailed studies.

5.1.2 Capital

- The firms that were interviewed had capital or access to capital to develop energy efficiency projects. Capital may be less available to some of the firms that could not yet be interviewed, for example, those in the pulp and paper sector.
- Firms are typically looking for two-year paybacks or less. However, some firms can tolerate longer payback periods. The size of a project and other factors such as the need for replacement can influence payback requirements. Larger projects may require shorter paybacks and the need to replace equipment can result in accepting longer paybacks.
- The availability of capital for energy efficiency projects is time sensitive. It is usually available for a fixed or variable period and if not used within that period can then be used for other purposes.

5.1.3 Incentives

- The size of the incentives being offered by IAP is attractive to the respondents.
• Nearly all of the firms had been considering energy efficiency before IAP although for different reasons. Corporate sustainability issues were driving some. The Northern Industry Electricity Program (NIER) program resulted in some having begun to address energy efficiency. Still others had corporate policies and/or internal committees that were addressing the issue.
• Even so, firms indicated that the incentives provided by IAP motivated them to undertake projects that would not previously have met their payback requirements and caused them to identify some large and previously unknown efficiency opportunities.

5.1.4 The IAP Process
• Respondents identified four areas where they felt there could be improvements to the IAP Process: the contract, the amount of time and effort spent in the review process, the number of steps in the process, and the need for the process to more closely align with the rhythms of industrial operations.

5.1.5 Contracts
• The length and complexity of IAP contract means project decision-making involves legal counsel, which does not always exist in-house for smaller firms. While firms understood the need for OPA to manage risk, most felt that the contract was overly long and restrictive and represented a barrier to some projects or to program participation.
• The 10-year contract period with the M&V and the claw back provision was cited as a deterrent to some projects and to program participation because of changing technologies and future global marketplace uncertainties. Respondents suggested that a period of less than five years would be more acceptable.
• The minimum and maximum levels of savings and the maximum limit on the size of the incentives were problematic for some. The IAP requirements were perceived as too onerous to make qualifying smaller projects worth doing. For a few very large projects, the upper limit on incentives was too low to make the projects meet firms’ payback requirements. It was suggested that the savings levels for micro-projects be raised.
• A more flexible and dynamic program structure that allows project implementation around the capabilities and size of companies and projects is desired.

5.1.6 Technical Reviews
• The technical reviews were perceived as having a one size fits all quality. The amount of technical review needs to be better coordinated with the size and complexity of projects.
• Communication with the Technical Reviewer was perceived to be too formal. Firms would like to interact more informally over the phone to speed the technical review process and avoid project application errors.
• Firms would like more timely information about the status of their project during the review process.
• There was some expression of concern that early technical reviews were not always complete or accurate.
5.1.7 Timing Requirements

- Concern was expressed that the IAP program model did not recognize critical timing requirements such as the need to install equipment during scheduled outages and the lead time for equipment purchases,
- The program process also needs to recognize the limited time availability of capital

5.1.8 Other Findings

- Most respondents could provide examples of enabled savings associated with their projects.
- From a marketing perspective, firms are motivated more by productivity improvement and reductions in material waste and energy intensities than “energy efficiency” *per se*.
- Non-energy benefits such as improved product quality and purity, reduced material consumption and maintenance costs, and reduced environmental emissions, were important to firms as well.

5.2 Recommendations

- The upper limit for incentives be reviewed and raised if possible to allow for larger projects.
- The savings limit associated with micro-projects be raised substantially to facilitate a simpler process that does not require a detailed study for projects like air compressor projects, or a graduated scale of incentives and requirements be instituted that would allow firms to select a level of incentives and paybacks with which the firm is comfortable.
- A concerted effort be made to reduce the bulk of the contract to perhaps 15 to 25 percent of its current size and to make the language clearer.
- The length of the contract and the monitoring period be reduced to the calculated payback period for the measure without incentives or a fixed period such as five years.
- Further efforts be made to coordinate the level of effort for the technical reviews with the size and scope of the projects. Perhaps a cap on the level of effort of the technical review process should be placed on projects costing less than $100,000. The budgets for technical reviews should be related to the opportunity to significantly reduce error bands and the size of such reductions. Technical Reviewers should quickly identify alternative evaluation methods and choose a method that produces acceptable results in relative and absolute terms at least cost.
- More communication such as a project initiation meeting, site visits, telephone and e-mail communication are needed to facilitate and speed technical review.
- Make the process more responsive to timing requirements and information needs of participants by use of management software with automated e-mail notification and calendar items.
- Establish a critical timeline worked out among representatives of the firm, the KAMs, and the Technical Reviewers when the project is initiated. The timeline should be based on critical factors such as the availability of capital, the timing of maintenance outages, and purchasing requirements.
• OPA processes and approvals should meet the timeline established by the KAM and the project manager.
• Consideration be given to providing a notice of intent to award a contract from OPA to participants that could be issued well in advance of a formal contract to provide more flexibility in initiating projects.