Prospectus Business Plan

Canadian Industrial Energy End-use Data and Analysis Centre

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1 Executive Summary

1.1 Background

The Canadian Industrial Energy End-use Data and Analysis Centre (CIEEDAC) was established in January, 1993 at the School of Resource and Environmental Management at Simon Fraser University under Natural Resources Canada’s National Energy Use Database (NEUD) initiative. The primary goal of the NEUD, an initiative begun in October, 1991, was to expand and improve the existing knowledge on energy use and efficiency at the end-use level by establishing processes for the regular and timely collection of reliable data on energy use, on the characteristics of energy using equipment and buildings, and on the behaviour and attitude of Canadian consumers with respect to energy use and the adoption of energy efficient technologies. CIEEDAC is responsible for the industrial energy data under this initiative.

The Centre operates as part clearinghouse, part depository, and part analysis centre for energy data on the Canadian industrial sector. Industry analysts can use CIEEDAC as a source for data and have the option to use CIEEDAC to further analyze specific data-related issues. In terms of its database role, the Centre focuses on methodologies of data collection and the establishment of effective, user-friendly databases on energy use and end-use in Canadian industry. In addition to access to the databases, the Centre provides up-to-date documentation of the various databases and houses a specialized library of published reports related to industry in Canada. CIEEDAC has access to an extensive end-use database that covers the following categories:

- stocks of existing equipment;
- characteristics of new and emerging technologies;
- decision-making factors and behaviour of industrial managers when acquiring, upgrading and operating energy-using equipment;
- characteristics (costs, energy use etc.) of existing and upcoming technology stocks.

CIEEDAC’s end use database on industry continues to be used for analyses related to Canada’s efforts to reduce energy intensity and GHG emissions levels by many different government and research agencies using an in-house energy / economics simulation model called CIMS.

CIEEDAC undertakes a wide variety of projects each year. Annual publications include:

- enerInfo Industrial (newsletter, published 3 times annually)
- A Review of Cogeneration and Renewable Energy Facilities in Canada
- An Inventory of District Energy Systems in Canada
- Regular Progress Reports, Prospectus / Business Plan.
- Development of Energy and GHG Intensity Indicators for Canadian Industry
- A Review of Energy Use in Canadian Oil Refineries, 1990, 1994 to current
- Detailed industry reports on energy use and emissions associated with supporting organizations and associations.
1.2 Organization & Sponsorship
CIEEDAC is housed at the School of Resource and Environmental Management (REM) at Simon Fraser University as part the Energy and Materials Research Group (EMRG). The Centre encourages the development of Canadian expertise in its area of specialization by supporting the work of Ph.D. and Masters students. An Advisory Committee, composed of the Centre's Director, representatives of the various sponsoring and supporting organizations, and an academic representative, is responsible for defining the core funded portion of the Centre's work program. The Centre receives funding primarily from Environment Canada and Natural Resources Canada (through contracts), supplemented by various industry associations and other agencies.

1.3 Future Direction
With increasing international concern about energy sources and its effects on the environment and climate change, analysts and decision makers emphasis the need for good data, proper data collection and management and appropriate monitoring functions for both energy, CO₂ and other greenhouse gases. CIEEDAC is well situated to serve the community in this regard and acts to fulfill these demands. It proposes a set of short-, medium- and long-term plans to meet the needs.

1.3.1 Short Term (1 year)
CIEEDAC will carry out the following activities each year:

- Complete yearly analyses and reports on energy use, energy intensity, and GHG emissions as described above,
- Maintain the databases including the updating of data each year, the upgrading of database software, and the improvement of the accessibility and availability of the data.
- Explore the continued disaggregation of the Industry Consumption of Energy (ICE) survey to more sectors and regions in cooperation with CIEEDAC’s supporters and Statistics Canada (STC).
- In cooperation with Environment Canada (EC), continue to include data on materials flow and emissions to the database on industry end uses of energy.
- Work with specific industries over time to review end-use data.
- Expand and further develop the database on district energy, cogeneration and renewable energy use in Canada.

1.3.2 Medium Term (2-5 years)
In the medium term, CIEEDAC will further improve and develop its databases by:

- Maintaining and improving its liaison with STC and various industry associations and provinces, with the focus on improved data collection and review for the major, large industries in Canada.
- Maintaining and improving its liaison with EC, especially in terms of GHG emissions and Canada’s GHG Inventory. There are also analyses underway to
compare emissions of various industries when using alternative, publicly available data.

- Expanding and improving access to databases on cogeneration, renewable energy and district energy.
- Determining the cost and benefits of expanding data collection on energy use in industry at greater levels of both sectoral and regional disaggregation.

As noted, CIEEDAC has already begun work in many of these areas.

1.3.3 Long Term (5+ years)

CIEEDAC’s long-term direction reflects the undercurrent of its activities both in the present and for the future. It is focused on developing databases that allow for comprehensive analysis on energy efficiency and intensity indicators, both nationally and internationally and for investigating the energy efficiency and emissions reduction potential in industry. As interest increases in how materials are used in these sectors and how these flows impact energy use, data related to material flows will also be examined and, at some future point, included. Specific long-term goals include:

- maintaining its position as an international leader in industrial energy use and efficiency data analysis, serving as an example to other countries;
- having CIEEDAC recognized as the most consistent and reliable industrial energy data base for Canada that can be used by all;
- assessing material flows (especially GHGs), impact on energy flows, and development of data to explore energy / materials efficiency objectives,
- developing a protocol for international co-ordination, co-operation; CIEEDAC will participate in a hybrid model project involving many European and American modelling analysts including the Energy Modeling Forum at Stanford.

1.4 Future Support

CIEEDAC must be seen as a neutral, third party analyst of the data and tasks undertaken by CIEEDAC must be seen as free from bias. Thus, obtaining support for CIEEDAC’s activities from a number of different agencies and associations serve to establish and promote CIEEDAC’s third-party status.

At the same time, CIEEDAC desires to promote and stimulate data collection and resolve data-problems relating to industrial energy use where such action will be of value to its supporters. Both the Advisory Committee and CIEEDAC supporters point the Centre to such tasks. In 2015 / 2016, the Centre will look for provincial agency support when the opportunity arises. However, it aims to have sponsors from each of the following groups supporting annually:

- Utilities
- Industry associations and individual companies
- Research Institutes (funding institutes).
- Renewable Energy associations
- Cogeneration / Combined Heat and Power supporters
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- District Energy industry and related associations
- Federal agencies

Each year, CIEEDAC receives support from a number of agencies through the EMRG, its parent organization. Some agencies also directly support CIEEDAC with financial contributions.

Natural Resources Canada, historically a consistent funder of the Centre, now asks CIEEDAC to do specific tasks on a contractual basis. Environment Canada continues to support CIEEDAC through contribution agreements. In both cases, the arrangements cover multiple years; EC support of $75k is assured for this fiscal year and NRCan has renewed its contracts on data analysis, support for industry reports and the Cogeneration / Renewable Energy databases for the current year.

CIEEDAC will continue to pursue support from industry associations. While there is steady support from the major energy users, overall industry support is not increasing. For example, with a change in staff at the Automobile Parts Association, funding from them ceased this year. On the other hand, the Canadian Foundry Association increased its support last year.
2 CIEEDAC Today

2.1 Introduction

The Canadian Industrial Energy End-use Data and Analysis Centre (CIEEDAC) focuses on energy information relevant to Canada’s industrial sector. It began as part of a network of Centres established by Natural Resources Canada’s (NRCan) National Energy Use Database (NEUD) initiative. CIEEDAC’s primary goal is to expand and improve the existing knowledge on energy use and efficiency at the end-use level. This initiative serves and benefits data providers, data handlers and data users by improving the effectiveness of data collection and dissemination, as well as addressing weaknesses in Canadian energy data.

CIEEDAC (the ‘Centre’), established in January, 1993 at the School of Resource and Environmental Management (REM) at Simon Fraser University, functions under the auspices of REM’s Energy and Materials Research Group (EMRG). Interaction with this research group, as well as provincial, national and international experts, builds strong research base and helps develop communication channels which encourages information and data exchange, an important overall role for CIEEDAC.

With an established energy based focus, CIEEDAC’s analysis was broadened to deal with energy-related emissions of greenhouse gases (GHG). CIEEDAC therefore receives significant support from Environment Canada to support its efforts to assess CO₂ and other GHGs in more sectorally and regionally specific ways.

2.2 Principle Roles

CIEEDAC’s activities have already become critical to appropriate analysis, proactive research and policy development in at least five areas:

- monitoring industry’s energy use, CO₂ and other GHG emissions;
- identifying savings in energy-use by understanding end-use consumption patterns;
- investigating the link between energy and GHG emissions; and
- informing industry associations and provincial agencies of industrial energy picture;
- providing data on cogeneration, renewable energy and district energy,
- comparisons to international data on energy use and CO₂ emissions.

The Centre operates as clearinghouse, depository, and analysis centre for energy data representing the Canadian industrial sector. It collects data from many different sources at different levels of disaggregation and provides access to data or information about data to many different users. Industry analysts can use CIEEDAC as a source for data and have the option to use CIEEDAC to further analyze specific data-related issues.

2.2.1 Database Activities

The Centre focuses on method of data collection and the establishment of effective, user-friendly databases on energy use and end-use in Canadian industry. The Centre provides documentation, updated annually, describing various databases. It also houses
a specialized library of published reports; and maintains an inventory of existing databases related to industry in Canada.

**Industry Production and Energy Use**

Data on physical and economic indicators of energy use and industrial production are located at the Centre. These data are important to modellers, policy analysts, technology experts, energy marketers and other researchers and consultants. Supported by industry, CIEEDAC advocates for the development of physical unit indicators of production for use in the development of intensity indicators. This trend continues as more and more analyses depend on intensity indicators and benchmarking.

The data, primarily from Statistics Canada’s (STC) *Industrial Consumption of Energy* survey, are supplemented by data received by CIEEDAC either through its own survey collection or from data received from industry focussed collection agencies, such as from the Cement Association of Canada. In 2002, STC provided updated 1990 data in Canada, compiled from a number of other STC sources, as a base year. As with energy, this update of the 1990 base year has had an impact on the GHG emissions data provided by CIEEDAC. CIEEDAC provides data on industry emissions for CO$_2$, CH$_4$ and N$_2$O and an aggregate file on GHG emission that will include these three (with appropriate CO$_2$e conversion coefficients applied) as well as any process emissions captured by Environment Canada for industry.

Since 2006 / 2007, CIEEDAC has been increasingly constrained in its release of GHG related data on industry. Almost all industry groups found that total emissions data were not available by GHG type (CO$_2$, CH$_4$ and N$_2$O) and, thus, total GHG emissions could not be provided. This has raised concerns among industry associations; CIEEDAC was asked to estimate emissions levels for industries where such confidentiality had major impacts on estimated totals and continues to do so to the present day.

**Energy End-use**

CIEEDAC wishes to establish itself as the centre responsible for compiling and providing access to industrial end-use data on energy use, to facilitate national sharing of these data, and for promoting consistent and appropriate data collection and database development. End-use data focus on technology or process levels of energy use. Existing data are often associated with major end-use modelling efforts by government ministries, energy utilities and research institutes. This pursuit benefits not only these diverse organizations but also efforts at the national level (e.g., NRCan) to achieve the best possible understanding of the implications for Canadian industry of international negotiations aimed at various environmental or trade objectives.

CIEEDAC is strategically working towards an extensive end-use database that covers each of the following categories:

- quantities and characteristics of existing equipment stocks - number of units, unit output of product or energy, market share, fuel efficiency, operating conditions, emissions, fuel switching capability, etc. CIEEDAC has data on four historic years, 1990 1995, 2000, 2005 and 2010 data.
• characteristics of new and emerging technologies - energy efficiencies, costs, operating conditions, emissions, life span, year of market availability, market penetration constraints;
• decision-making factors and behaviour of industrial managers when acquiring, upgrading and operating energy-using equipment.

The data on technology detail and end use consumption is associated with the EMRG’s\(^1\) energy end-use model called CIMS. This model requires an in-depth understanding of the data and characteristics of industry’s energy end-use consumption over time. We developed a more functional and usable database system both in terms of the model’s requirements and for more general public use. We continue to improve the data system and focused on improving and updating the quality (and in some cases, quantity) of the data available for use in end use models of many sorts (MARKAL, Maple-C, ITEMS, Energy 2020). CIEEDAC has continued to update the database with new data on energy using technologies. In the last years, the focus was on technologies associated with CO\(_2\) sequestration (CCS – carbon capture and storage) as well as updating behavioural parameters (especially as they apply to the US). More recently, interest has moved into the transportation sector where a number of issues that affect technology choice come to play; freight transport is one aspect of this to be reviewed in this year. We established an on-line prototype for CIEEDAC to display these data but limited resources prevented further progress on project; the data remain available by request.

Data have also been made available in the context of CIEEDAC’s in house end use model, CIMS. The database is available by request to those interested in using the information contained therein. Before distribution, all confidential data are cleared from the database.

**Database Maintenance**

In order to successfully develop and maintain the above databases, CIEEDAC is responsible on an ongoing basis for:

1. compiling, defining, describing and archiving data in a consistent and transferable manner that is easily accessible to prospective users;
2. security of data and databases;
3. assessing the quality and information gaps associated with existing data, so that funding on data collection activities can be more cost-effective;
4. performing basic statistical analysis of the data where appropriate and more in-depth analysis where needed, especially as it relates to energy efficiency potential, energy intensities, GHG emissions and environmental impacts;
5. identifying key data requirements;

\(^1\) The work of the EMRG is described in Box 3 below.
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6. reviewing and assessing existing and emerging data sources for their ability to meet key data requirements of the Centre, including emissions and, more recently, material flow data;
7. negotiating to acquire the key data from various sources;
8. determining the relevant applications of end-use data;
9. maintaining a group of sponsors to ensure reliable and stable financial support and broad representation of interests;

2.3 Projects and Publications

As part of the agreement established between the Centre and NRCan, CIEEDAC publishes a set of reports, newsletters and a business plan (Box 1). Certain data focused projects will be maintained (Box 2). With the change in procedure, other projects that include analyses of existing databases, development and analysis of databases for specific industries and reviews of energy measurement and monitoring in other countries may be undertaken.

BOX 1: CIEEDAC Publications as part of its agreement with Environment Canada and it supporters

◊ **enerInfo Industrial** — now in its twentieth year, this newsletter informs interested parties of the Centre’s activities and important data issues. Published three times per year, it is freely distributed nationally and internationally in English and French to over 300 recipients. Currently, most of the recipients receive it via email.

◊ **Regular Progress Reports** — a summary of the work done in the previous period. These are distributed to CIEEDAC sponsors, the Advisory Committee, NRCan and EC biannually.

◊ **Prospectus / Business Plan** — this publication, updated annually, provides recipients with the prospectus of the Centre and its short-, medium-, and long-range plans.

2.3.1 Personnel

The Centre encourages the development of Canadian expertise in its area of specialization by supporting the work of Ph.D. and Masters students. The Centre brings together a multi-disciplinary team with expertise in engineering, economics, biological sciences, political sciences, computing, statistics and business. Except for the Director, Executive Director and Research Associates, the researchers at this university-based Centre are graduate students, often engineers or economists completing a masters degree (MRM) at REM.

**Director:** Mark Jaccard, Ph.D.

**Executive Director:** John Nyboer, Ph.D.

**Associate:** Jonn Axsen, Ph.D.

**Administrator:** Noory Meghji

◊ **Development of Energy Intensity Indicators for Canadian Industry, 1990 to 2013** – This report generates a comprehensive picture of energy use in Canadian industry, examining publicly available data (usually from Statistics Canada [STC]) on energy use and intensity. The report includes production data on physical and monetary output, also from STC, that act as the denominator to generate energy intensity values. It reviews problems with the data, comments on indicators and offers information on correcting or improving the data collection for better future monitoring and tracking. CIEEDAC incorporates updated data as they are received and suppresses 1991-1994 data because these data were compiled from a number of other sources.

◊ **Development of GHG Intensity Indicators for Canadian Industry, 1990 to 2013** – A compendium to the previous report with the focus on CO₂. Data on CH₄ and N₂O emissions, with an aggregated GHG emission database are also available on request, or downloadable, from CIEEDAC.

◊ **Energy Use and CO₂ Emissions in Canadian Oil Refineries, 1990, 1994 to 2013** – This report examines energy use and CO₂ emissions trends in the petroleum refinery industry. CIEEDAC generates this annual report after receiving data from Canada’s refineries.

◊ **A Review of Existing Cogeneration Facilities in the Canadian Industrial Sector** – CIEEDAC will simply update its historic report dependant on the data it receives.

◊ **A Review of Existing Renewable Energy Facilities in Canada.** – CIEEDAC will simply update its historic report dependant on the data it receives.

◊ **An Inventory of District Energy Systems in Canada.** – CIEEDAC will simply update its historic report dependant on the data it receives.

*Research Associates:*

- Chris Bataille: B.A. (Econ), MRM, Ph.D.
- Suzanne Goldberg: B.A. (Business), MRM
- Noel Melton: B.Sc. (Geology), MRM
- Rose Murphy: B. Sc. (Biology), MRM, Ph.D.
- Jotham Peters: MRM
- Jacqueline Sharp: MRM
- Michael Wolinetz: B.Sc. (Chem), MRM

*Programmers:* Paulus Mau (MRM)

*Researchers:*

- Dominique Atherley: B.Sc. (Env Sc) , REM Masters Student
- Kaitlin Boyd: B.A. (Poly Sci), REM Masters Student
- Todd Brunner: B.Sc. (Env Sci), REM Masters Student
- Joshua Cairns: B.Sc. (Geo), REM Masters Student
- Stephen Healey: B.A. (Econ), Masters (Public Policy), REM Ph.D. student
- Mikela Hein: B.A. (Econ), REM Masters Student
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- George Kamiya: B.Sc. (Marine Biology), REM Masters student
- Justin Lepitzki: B.A., REM Masters Student
- Ekaterina Petropavlova: Masters in International Business, REM Ph.D. student
- Anita Sun: B.Sc. (Chem), REM Masters Student
- Maxwell Sykes: B.A (Bus Admin), REM Masters student
- Lejla Uzicanin: B.Sc. (Admin), MBA, REM Masters Student
- Tiffany Vass: B.Sc. (Env Sci), REM Masters Student
- Brett Zuehlke: B.Sc. (Env Sci), REM Masters Student

2.3.2 Associated Agencies and Institutions:
CIEEDAC is associated with a number of agencies and institutions. These include:

- Canadian Centre for Energy Information;
- Energy Councils: National Energy Board, Alberta Energy Utilities Board;
- Environment Canada;
- Industry Canada;
- Intergovernmental Panel on Climate Change (IPCC), United Nations Framework Convention on Climate Change (UNFCCC)
- International District Energy Association (IDEA)
- International Network for Energy Demand and Efficiency Analysis of the Industrial Sector (INEDIS)
- Low Carbon Society Research Network (LCS-RNet)
- Other international agencies: International Energy Association, Fraunhofer Institute, Riso (Denmark), EnerData (France).
- Statistics Canada;
- United Nations Industry Development Organization (UNIDO)
- Pacific Institute for Climate Solutions (PICS), U. Victoria
- Provincial energy ministries: BC Min. of Environment, Ontario Min. of Energy, Science and Technology, Québec Ministère des ressources naturelles;
- Utilities: BC Hydro, Ontario Power Authority, Hydro Quebec; ATCO Gas

Salaries
Dr. Jaccard receives no salary from CIEEDAC, except for specific contracts in which his time is specified and approved in advance. Part or all of Dr. John Nyboer’s salary is paid by the Centre. Payments to students are salaries for general database work, and in some cases, stipends for specific tasks that conform to a student’s thesis research topic. The programmer and researchers receive remuneration only for specific contracted tasks. Secretarial services are subcontracted on an ongoing basis.
BOX 3: School of Resource and Environmental Management, the Energy and Materials Research Group.

School of Resource and Environmental Management (REM) - The Masters and Ph.D. programs in the School of Resource and Environmental Management promotes interdisciplinary training that includes graduate courses in resource economics, quantitative methods, energy management, energy system modelling (for energy students) and cost-benefit analysis.

The Energy and Materials Research Group (EMRG) - The EMRG, a group of researchers within the REM program, has developed and applied detailed models of end-use demand for the industrial and other sectors. Research focuses on energy and materials flows in both demand and supply side components of the Canadian energy system. These analyses span national, regional, provincial and community levels. Reports produced by the EMRG focus on a number of energy and emissions related topics. A list of publications is available from the EMRG and can be seen on its web site at www.emrg.sfu.ca. EMRG is funded by consulting contracts from government agencies and private companies and by government and university scholarships. Professional associations provide expertise to EMRG and support is also received from other academic and consulting organizations.

2.3.3 CIEEDAC’s Advisory Committee

An Advisory Committee, composed of the Centre’s Director, representatives of the various sponsoring and supporting organizations, and an academic representative, is responsible for defining the core funded portion of the Centre’s work program. This group can be supplemented by the addition of subject area specialists, as required, to guide the Centre’s activities. The director and sponsor representatives nominate subject area specialists.

The Centre holds an annual meeting (conference call) of the Advisory Committee to present a summary of its activities of the year and to discuss plans for the following year. The Centre prepares a brief quarterly report informing sponsors and the Advisory Committee members of its activities.

2.4 Support

The Centre’s largest funders are Natural Resources Canada (through the Office of Energy Efficiency and CanmetENERGY) and Environment Canada. The Centre is supported by a number of industry associations, primarily through its parent organization, the EMRG. The following organizations provide support, either to EMRG or directly to CIEEDAC:

- Aluminium Association of Canada (1998 - 2014)
- ATCO Gas (2013)
- Automobile Parts Manufacturing Association (2011 - 2013)
- Brewers Association of Canada (2011 - 2014)
- Canadian Construction Association (2003 - 2014)
- Canadian Electricity Association (2003-2009)
- Canadian Energy Pipeline Association (2011-2012)
- Canadian Fertilizer Institute (2011 - 2014)
- Canadian Foundry Association (2000, 2002 - 2014)
Canadian Fuels Association (1996 - 2014)
Canadian Gas Association (2007 – 2014)
Canadian Lime Institute (2011 - 2014)
Canadian Steel Producers Association (1997 - 2014)
Canadian Textiles Institute (1997 - 2000)
Cement Association of Canada (1998 - 2014)
Mining Association of Canada (1998 - 2014)
Ministère des ressources naturelles, Québec (1996 - 2006)
National Research Council (2014)
Regional Infrastructure Working Group, now known as the Oils Sands Community Alliance (2001)
Pacific Institute for Climate Solutions (2010 - 2012)

The Centre annually solicits support from a number of organizations. Sponsors may have varying contractual arrangements with the Centre, some requiring a minimum level of service (data review, analysis, modelling, etc.) on a regular basis. Support is typically provided to EMRG as CIEEDAC’s parent organization.
3 CIEEDAC Tomorrow

3.1 CIEEDAC in Context

CIEEDAC is focused on maintaining the role set out for it under NRCan’s NEUD initiative. With the change in support structure, further development is not required. The Centre’s main tasks will relate to expanding and improving the existing knowledge on energy use and efficiency at the end-use level as well as related GHG emissions. For the upcoming year, CIEEDAC will continue to spend time improving the quality (and, in some cases, quantity) of the technology data including energy end use; these are somewhat contingent on the research undertaken by EMRG as it develops its in-house model, CIMS. It also plans to continue its development of the cogeneration, renewable energy and district energy databases, focusing on data gathering and improvement, as well as expanding data analysis of the data available.

In response to demands from industry and government, CIEEDAC proposes a set of plans for the short-term (1 year), medium-term (2-5 years), and long-term (5+ years) future.

3.2 Future Plans

3.2.1 Short Term

CIEEDAC undertakes a number of operations on an annual basis. Each year CIEEDAC personnel discuss activities for the upcoming year with sponsors, Advisory Committee members and NRCan, the principle supporter of CIEEDAC. The work can be divided into three different categories: Annual Activities, Special Projects and Database Maintenance.

Annual Activities

CIEEDAC completes a number of annual newsletters, reports and analyses, described in section 3 above in Box 1 and Box 2. The analyses cover energy use, energy intensity, and GHG emissions.

Special Projects

As a benefit of sponsorship, CIEEDAC provides special reports focused on the industry or region of the sponsors. For 2015, CIEEDAC will publish industry reports on 11 industry sectors: aluminium, cement, chemistry industry, construction, electricity supply, foundries, mining and smelting, petroleum products, pulp and paper, wood products and iron and steel. The reports include data on provincially disaggregated energy use and on CO₂ emissions, if available.

CIEEDAC will also publish provincial reports for Provinces by request. CIEEDAC sought to extend this process to other government agencies where local energy suppliers or agencies (gas and electric utilities, research institutes) support the centre on behalf of the provincial government but this met with no success.

In 2010, the Canadian Electricity Association stopped supporting CIEEDAC. CIEECAC has generated a report for this supply sector since 2002 and will continue to generate this
report because of the importance of this report to the other industrial sectors for which a report is generated. Currently CIEEDAC is supported NRCan’s OEE to continue this report.

Database Maintenance

One may think that, once a value or data point has been defined, it would remain constant. Such is not the case; new evidence requires constant updating and improvement in the existing data and conversion coefficients. Maintenance of the database, upgrading database software and improving accessibility and availability of the data consume considerable time at CIEEDAC. Five such activities are described below:

- Update of existing databases – STC released an updated, NAICS-based review and analysis of the 1990 base year in 2002, electricity use in most industry groups for 1995 - 2003 in 2006 and provides annual updates to previous year’s data.
- Coefficients that are used in calculations (energy values, GHG coefficients) are continually reviewed and updated if necessary.
- Because GHG data are not always available, due to confidentiality, CIEEDAC reviews alternative methods of estimating emissions data and updates the database as required.
- Database on cogeneration and renewable energy supply – These databases are updated when funding is available and are based on publicly available data or on surveys distributed to those who generate renewable supply or cogenerate heat and electricity. CIEEDAC obtained funds for the last two years to update both databases. This is the most consistent stream of funding it has received over the last 6 years and CIEEDAC hopes to retain this consistent funding for future years.
- Database on District Energy – In the last two years, CIEEDAC established and populated the District Energy database on CIEEDAC’s home website. Last year also saw this database harmonized with the cogeneration and renewable energy databases. This year, CIEEDAC hope to obtain funding (also on a consistent annual basis) to distribute its survey again and to increase the level of respondents to the survey. It will also seek to integrate data from publicly available sources.
- End use data are always being updated and corrected. This year, CIEEDAC plans to make all non-confidential data on its website (see next).
- WWW site and availability of reports and data – reports and data have been available on line since 2002.

3.2.2 Medium Term

Medium-term goals focus on two aspects of the Centre’s function, already played out to some extent in the last years: 1) the development of a strong supporting contingent that includes all stakeholders² and 2) the improvement and development of energy,

²This is to develop credibility; currently up to 15 supporting groups outside of the main sponsors, NRCan’s OEE and EC.
emissions and materials data including GHG. CIEEDAC is developing a strong support network that includes utilities, provincial governments, industry, and federal agencies. These activities should not be seen as beginning in two to three years but rather that their outcomes would be evident over that time period. Actions to achieve the goal of improving and developing the data include the following:

- The Centre will continue to improve its liaison with STC and various industry associations, with the focus on improved data collection and review for the major, large industries in Canada.
- The Centre will continue to interact with Environment Canada with the focus on improved assessment of GHG emissions in terms of inventory and estimation (quantity of emissions are typically derived from other data).
- CIEEDAC continues to be involved with the IPCC and CIEEDAC staff have been involved with recently released IPCC and UNIDO report as an author and expert on renewable energy its role in GHG emissions reduction as well as industry technology development.

3.2.3 Long Term

In the long term, the Centre will continue to concentrate on data on energy use and particularly end-uses of energy in Canadian (and for that matter, international) industry. The long range perspective remains firmly focused on developing databases that allow for comprehensive analysis on energy efficiency and intensity indicators, both nationally and internationally, and for investigating the energy efficiency and emissions reduction potential in industry. Again, it should be emphasized that these activities are ongoing and that the goals defined here form the undercurrent of the intended activity of CIEEDAC. This perspective includes promoting mutual co-operation between various stakeholders in an effort to improve the data, both on a national and international scale. The Centre’s specific long-term goals are:

1. **To maintain its position of international leadership in industrial energy use and efficiency data analysis, serving as an example to other countries.** As mentioned, CIEEDAC is already headed in this direction with proactive research and policy development in key areas. Emerging energy-related environmental issues on both a national and international scale require analyses on two fronts:

   - monitoring industrial energy activity - the appropriate and consistent tracking of energy use and consequent CO₂ emissions in specific industries over time, and
   - monitoring and analyzing the potential for increased energy efficiency and CO₂ emissions-reduction activity to assess the costs and potential for energy efficiency and fuel switching in Canada that would reduce the emissions of potentially harmful gases.

2. **To have CIEEDAC recognized as having the most consistent and reliable industrial energy database for Canada that can be used by all.** CIEEDAC will ensure the creation of a database management system taken from a wide range of sources,
and which is suitable for managing a wide range of data related to the industrial sector. The database management system created at the Centre will be sufficiently flexible to allow the reading and manipulation of a variety of databases. The Centre will make its data and analysis available to all those who request it, subject to the following constraints:

- restrictions due to dissemination agreements negotiated with data providers and users, and
- confidentiality provisions precluding the release of data disaggregated at a certain level.

Generally, services for data access would be provided on a cost-recovery basis. However, individual sponsors could write conditions into their funding arrangements that ensured specified levels of free access and service. Access to data would, of course, be governed by the procedures agreed to with data providers and Centre sponsors. Additionally, direct, on-line access will be developed as much as possible.

3. **End-use data development** – Also described in the previous section, CIEEDAC’s derived end-use database will be maintained as a “by request” system where CIEEDAC will provide data to users based on requests made for these data.

4. **Development of a protocol for international co-ordination, co-operation** - CIEEDAC has already been active in this area and is participating in an international assessment of hybrid modelling techniques for the purposes of enhancing its database and the development of EMRG’s in-house model, CIMS. CIEEDAC continues to participate in the world-wide venture of establishing protocol for CO2 and other energy / emissions initiatives, and is part of an international network centred in Lawrence Berkeley Laboratories. CIEEDAC researchers currently participate in the activities of the prestigious Energy Modeling Forum (EMF) centred at Stanford in California. Dr. Jaccard also plays a key role in the Global Energy Assessment, sponsored by IIASA. Future efforts will strengthen this international role by leading and participating in future workshops, and improving the coordination of projects.

### 3.3 Future Support

In order to maximize the benefits derived from CIEEDAC’s function as a data analysis centre, CIEEDAC has turned its support efforts to its parent organization, the Energy and Materials Research Group (EMRG).

CIEEDAC receives funding from many organizations through its parent group, ERMG. EMRG seeks support on a number of fronts, including research awarding agencies such as NSERC and SSHRC as well as:

- **Utilities**: EMRG will continue to approach natural gas and electricity utilities. Indeed, the CEA has supported CIEEDAC from 2003 to 2009 and the Canadian Gas Association since 2007.
Prospectus & Business Plan

- **Industry associations and individual companies:** Many industry associations already provide support that is expected to grow as the results of CIEEDAC’s work increasingly affect their analyses. These include those listed in Section 5 under “CIEEDAC Today”. The level of support from these organisations to EMRG varies based on economic conditions and other funding CIEEDAC has been able to obtain.

- **Provincial agencies:** EMRG expended considerable time and energy to acquire provincial sponsorships but thus far, this has not been profitable.

- **Federal agencies:** Outside of NRCan’s OEE and Environment Canada, CIEEDAC has participated in activities related to the work of CanmetENERGY with regard to District Energy and most recently with the National Research Council looking at renewable energy use in remote communities.

In attracting new sponsors, CIEEDAC will emphasize the following specific benefits:

- Review and analysis of existing energy surveys, including a yearly analysis of data released by Statistics Canada as it reflects industry.
- Centralization of industrial energy use data by industry and by region of Canada (where such information is available) and for aggregate comparisons of Canadian industry with those in other countries.
- A third party vehicle through which data and associated environmental issues, both national and international, can be presented and resolved (national and international monitoring, international comparison of standards).
- Access to CIEEDAC databases through the internet or from the Centre directly.
- Mechanism for data sharing between users.
- Up-to-date reports on the industrial energy database inventory in Canada.
- Opportunity to influence data collection direction.
- Expertise and guidance in the design of energy surveys as well as end-use surveys in the industrial sector.
- Fast track analyses as requested for urgent policy analysis questions or industry specific comparative analyses.
- Expertise and guidance to support longer term research and development targets.
- Availability of a pool of highly trained university researchers.
- Availability of speakers to address data or related issues for workshops, conferences, panel discussions and the like.
- Biannual reports defining the activities of the Centre.
- Recognition as a supporter of CIEEDAC.

### 3.4 Budget and Support

Support from EC will continue for the 2015 / 2016 year. Contracts with NRCan on energy data analysis, industry reports and the Cogeneration and Renewable Energy database are also renewed for this year. These will be supplemented by support from industry associations through EMRG.
3.4.1 Anticipated Funding Sources 2015 / 2016
Funding covers all continuous and regular costs of maintaining the Centre. Additional tasks would be billed on a cost recovery basis.

<table>
<thead>
<tr>
<th>Source</th>
<th>Env. Can</th>
<th>Industry/other</th>
<th>Contracts</th>
<th>Total</th>
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<tbody>
<tr>
<td>Amount</td>
<td>$75,000</td>
<td>$50,000</td>
<td>$100,000</td>
<td>$225,000</td>
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3.4.2 Anticipated Budget, 2015 / 2016
The major change in this support is the addition of research that allows for the development of the cogeneration, renewable energy and district energy databases.

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
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</thead>
<tbody>
<tr>
<td>Salaries and benefits</td>
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<tr>
<td>University operational costs (space, services, utilities, etc.)</td>
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<tr>
<td>Administrator, Secretary</td>
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</tr>
<tr>
<td>Contracted services (off-campus, programmer, research)</td>
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<tr>
<td>Travel</td>
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<tr>
<td>Computers, software, programming</td>
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<tr>
<td>Misc. Expenses (office supplies, repairs, printing, etc.)</td>
<td>$1,500</td>
</tr>
<tr>
<td><strong>Total Budget, 2015 / 2016</strong></td>
<td><strong>$225,000</strong></td>
</tr>
</tbody>
</table>