



CHANGING PERSPECTIVES FOR ONTARIO'S ELECTRICITY GRID

The New Reality:
No Day is Like Another

A Responsive Kind of Demand:
New Roles and Opportunities

PLUS
Listening, Responding & Acting:
Stakeholder Relations at the IESO



ieso

Power to Ontario. On Demand.

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NO DAY IS LIKE ANOTHER

A fundamental shift has taken place in Ontario's power sector – with the rapid growth of renewable resources, the shutdown of coal and the implementation of new technologies on the horizon. The Independent Electricity System Operator (IESO) and others are exploring ways to maximize the benefits of these investments. **Pg 6**

TIMELINE

An Abbreviated History of Ontario's Electricity System 2002-2012

Explore a decade of change in the way electricity is produced, delivered and consumed in Ontario. **Pg 4**

A Message from the Chairman of the Board and the President and Chief Executive Officer



Over the last decade, the Independent Electricity System Operator (IESO) has been immersed in the evolution taking place in the province's electricity sector. As the hub connecting generators, traders, transmitters, distributors and large consumers, it has encouraged and embraced change, focusing its efforts on supporting a more sustainable and diverse power system.

Today, Ontario's supply outlook is the strongest it has been in a generation while growth in electricity consumption is now muted by conservation and demand response. The sector has expanded to include many new participants and players from outside the traditional confines of our industry. In the background, digital technologies are permeating almost all aspects of the system, opening new avenues to explore.

As we mark the tenth anniversary of the opening of the wholesale electricity market, the IESO is moving forward with a new approach to system operations. In 2002, Ontario's electricity sector was characterised by a series of large generators that responded to the direct needs of consumers. In 2012, the system started to become much more fluid, where the roles of consumers and producers have become less distinct, and a more dynamic relationship is emerging between them.

As a result, the IESO has concentrated its resources on preparing for these changes. With 6,800 megawatts (MW) of variable generation either connected to the grid, or embedded within distribution networks by mid-2014, we need new expertise and tools in order to continue to manage the system reliably and efficiently. At the IESO, we are changing some of the fundamentals of system operations and expanding and improving our capabilities as an organization.

The IESO in 2013 is younger and more diverse – in terms of its people, their skills and their experiences. We have worked hard to attract some of the brightest and most innovative minds in our sector, but have also focused on



ensuring that we retain the insights and knowledge from our more experienced staff. And to support our employees, we are renewing the information technologies that enable us to manage the greater levels of complexity that we face.

We also draw on our relationships with the broader sector to help us better understand how to carry out our market and system responsibilities in this shifting environment. We have learned much through our external consultations, and are appreciative of all those who contribute to our stakeholdering processes.

Looking ahead, the IESO is focusing its efforts on optimizing the province's investments in electricity infrastructure.

Our Renewable Integration Initiative is incorporating wind and solar generation into the core of our system operations and there is a need to bring storage capabilities and demand response into the market in new ways. The fundamental structure of the renewed sector is in place; now it is our shared responsibility to leverage this investment to ensure it delivers maximum benefits to ratepayers throughout the province.

We are mindful of the trust Ontarians place in us to ensure that the critical bulk electricity system infrastructure operates reliably and efficiently. To that end, we hold ourselves accountable to meet the highest of standards. And we do this in a fiscally responsible manner by managing our resources effectively and continuing to reduce the fees we charge our customers.

We offer this annual report as a guide to the efforts being made by the IESO and its partners in the industry. It provides a view of how far we've come, where we are now, and sets the stage for an ongoing discussion about how to move forward.

We look forward to continuing this conversation.

Tim O'Neill
Chairman of the Board

Paul Murphy
President and Chief Executive Officer

An Abbreviated History of Ontario's Electricity System

2002-2012

As Ontario's electricity industry continues to evolve, take a look back at 10 years of challenges, changes and successes that have contributed to shaping the electricity system of today.

May 1, 2002

Ontario's wholesale electricity market opens

THE AVERAGE ALL-IN-ENERGY PRICE FOR 2002:

\$47/MWh

2002

NEW GENERATION

Gas generation emerges as a key player in Ontario's supply mix. The first new gas generating station added to the grid was:



+ 580 MW
BRIGHTON BEACH
GAS GENERATING STATION

2004

27,005 MW
PEAK DEMAND

Ontario sets a record on August 1, 2006 at 5 p.m.

2006

2003

GENERATION REFURBISHMENT

Two nuclear units were refurbished to provide reliable electricity to Ontarians 24 hours a day, 7 days a week. They were the first of a number of units to be refurbished.



+ 515 MW
PICKERING
NUCLEAR UNIT



+ 770 MW
BRUCE
NUCLEAR UNIT

Blackout

The biggest blackout in North American history resulted in **61,800 MW** of power lost to over **50 million people** in northeastern U.S. and Ontario.

IESO staff, working with generators, transmitters and local utilities, co-ordinated the restoration of Ontario's power grid.

2005

ONTARIO BECOMES A NET EXPORTER OF ELECTRICITY

EXPORTS ⚡

IMPORTS



Peak demand in Ontario is consistently higher in the summer months due to the growth in air conditioning use.

The **Global Adjustment/Provincial Benefit** is introduced.

COAL RETIREMENT

Lakeview was the first coal generating station to be retired in Ontario.



- 1,130 MW
LAKEVIEW
COAL GENERATING STATION

NEW GENERATION

The first new **wind farms** are connected to the grid:

-  **+ 68 MW**
AMARANTH I
-  **+ 40 MW**
KINGSBRIDGE
-  **+ 99 MW**
PORT BURWELL
-  **+ 99 MW**
PRINCE WIND PROJECT
-  **+ 90 MW**
PRINCE II WIND PROJECT

6.1% Total **ONTARIO ENERGY DEMAND** decrease compared to the previous year.

Municipalities, Universities, Schools and Hospitals (MUSH) sector moved to spot market rates.

2009

2008

FURTHER OPPORTUNITIES FOR INDUSTRIAL AND COMMERCIAL CONSUMERS TO RESPOND TO DEMAND PEAKS

DR3, a contract-based program, provides financial incentives to participants for reducing their electricity use in response to system signals.

2010

INTEGRATING RENEWABLES

IESO begins stakeholder consultations for the Renewable Integration Initiative.

10,618 MW MINIMUM DEMAND

Ontario sets a record on April 4, 2010 at 5 a.m.

2007

LAUNCH OF THE OPA'S PEAKSAVER PROGRAM

Residential consumers and small businesses have the opportunity to contribute to demand response.

COAL RETIREMENT

Four units totalling 2,000 MW are shut down at the Nanticoke and Lambton Coal Generating Stations.



- 2,000 MW
NANTICOKE AND LAMBTON
COAL GENERATING UNITS

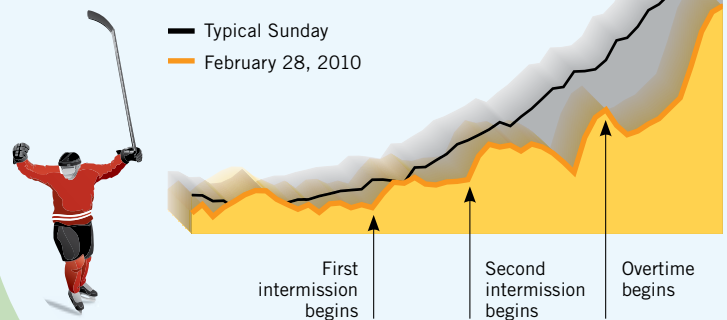
2011

3,600,000+

NUMBER OF ONTARIO CONSUMERS BILLED ON TIME-OF-USE RATES.

ONTARIO ELECTRICITY DEMAND: FEBRUARY 28, 2010

The impact of consumer behaviour on demand is especially evident during the Men's Hockey finals at the Vancouver Olympics.

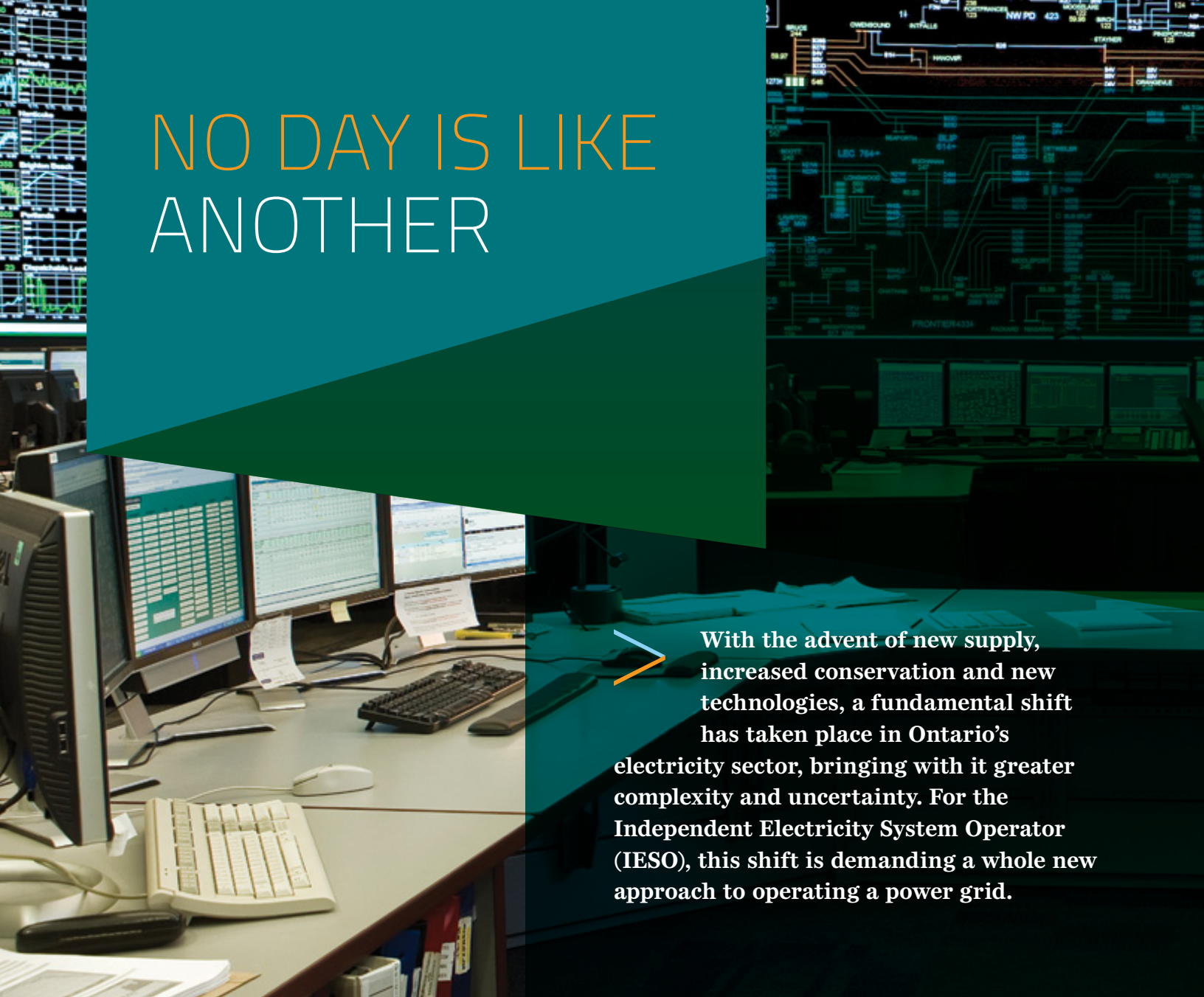


2012

The IESO implements a **Centralized Wind Forecasting Service** that more accurately predicts the generation output from wind facilities in Ontario. The wind forecast can be found at: www.ieso.ca/map.



THE AVERAGE ALL-IN ENERGY PRICE FOR 2012:
\$74/MWh



NO DAY IS LIKE ANOTHER

With the advent of new supply, increased conservation and new technologies, a fundamental shift has taken place in Ontario's electricity sector, bringing with it greater complexity and uncertainty. For the Independent Electricity System Operator (IESO), this shift is demanding a whole new approach to operating a power grid.

“When I get into the office in the morning, I usually go into the Control Room to take a look at how demand is ramping up,” says Leonard Kula, Manager, System Operations at the IESO, responsible for the operators who manage the real-time operations for the provincial power system. “At that time of day, system operators are busy ensuring there is enough generation to meet the rapid rise in demand as people throughout the province wake up and start their day. This morning ramp can typically build at 2,000 megawatts (MW) – the equivalent of the output from two or three large nuclear units – each hour.”

“But more often than not, by 9:00 a.m., demand has started to flatten out at much lower levels than we are used to seeing. Then I’ll look out the window and see that it’s a bright sunny day, and realize that all those solar panels in communities throughout the province are sending energy into local distribution networks which no longer need as much power from the provincial grid.”

And that is just one of the many new realities of running a modern electricity system – one where there are so many variables at play that no day is like any other.



IESO System Control Centre

A decade of change

The year 2012 marked an important anniversary for Ontario's electricity sector, as 10 years earlier, the IESO opened the province's electricity market using the wholesale price as the basis for the dispatch of generation.

During this time, the province went from supply shortfalls to adequate resource levels. Conservation appeals have given way to better energy management practices – and lower summer peaks. Large-scale generation facilities have been joined by numerous, often embedded, small-scale operations. And coal output in the province has been surpassed first by gas and now by wind.

NEXT: *THE STATE OF ONTARIO SUPPLY*, PAGE 8

The state of Ontario supply

➤ **Ontario's supply infrastructure has been renewed at a staggering rate, as refurbished nuclear units re-connected to the system, a new fleet of gas-fired facilities emerged on the scene and variable resources took their place among main-stream resources. Over the last 10 years, more than 12,400 MW in new supply was integrated into the grid – meeting the province's basic need for more power, but also working to meet more sophisticated operational requirements.**

“While there are some major decisions about new supply still outstanding, we now have much greater clarity around what the provincial supply mix is going to look like for the next number of years,” says Paul Murphy, IESO President and CEO. “We have a good understanding of what the balance between the various fuel types is going to be like and we at the IESO are gaining experience working with these different types of generation and learning how they interact.”

Toward the end of 2012, two refurbished units from the Bruce Nuclear Generating Station synchronized to an expanded transmission system, delivering energy to consumers in the GTA and beyond. This project, plus previous nuclear refurbishments, have ensured that nuclear generation continues to provide more than half of the provincial supply needs.

The shutdown of coal generation in the province continued with the 211 MW unit in Atikokan suspending production in 2012, and beginning the process of con-

verting to renewable biomass. In 2012, coal contributed less than three per cent of Ontario's total electricity production. Most of the 3,293 MW of coal capacity remaining in the province is slated for closure at the end of 2013.

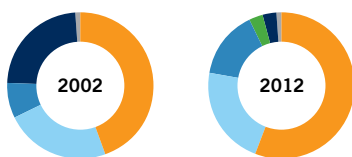
Gas generation, by contrast, has emerged from a minor role on the bulk electricity system to representing a quarter of provincial installed capacity, and offering much of the flexibility lost by the shut-down of coal. The York Energy Centre, the province's only simple cycle gas generation facility, fired up for the first time in Spring 2012, providing crucial fast-response ramping capability and supply to the grid.

Two thousand and twelve also marked the year that wind resources emerged as important contributors to meeting provincial power needs. More than 4.6 million megawatt hours (MWh) flowed from wind generators in 2012, or three per cent of total generation in the province, more than the output from the soon-to-be retired coal generators.

What is not captured in these numbers, however, is the rapid growth of generation embedded within local distribution networks. According to the Ontario Power Authority, by October 2012 roughly 600 MW of solar panels were soaking in sunlight and turning it into energy outside the sightlines of IESO operations.



GENERATION OUTPUT BY FUEL TYPE



● Nuclear	42.7%	56.4%
● Hydro	23.5	22.3
● Gas	7.6	14.6
● Wind	–	3.0
● Coal	23.9	2.8
● Other	0.9	0.8

The immediate outcome of these changes, accompanied by lower levels of demand, has been greater levels of energy self-sufficiency in Ontario and greater ease in meeting peaks. Yet, this growth in supply creates a different operational challenge – Surplus Baseload Generation (SBG) – when the output from nuclear, run-of-the-river hydro, embedded non-utility generators and wind exceeds demand.

For operators, managing SBG is less of a reliability concern, and more an issue of efficiency, ensuring that resources are used effectively, in terms of the impact on the equipment and cost. With sufficient resources to meet demand, system operations focus on the co-ordinating generators – and their different operating characteristics within a much broader range of scenarios.

These operational scenarios now include days with low minimum demands and high peaks taking place on the same day. System conditions on June 28, 2012, for example, offered a glimpse into this future – when the system was in surplus conditions early in the morning and demand rose 9,000 MW to an afternoon peak above 22,000 MW.

“These days, we feel like everything is new,” says Kim Warren, IESO Vice President, Operations and Chief Operating Officer. “We’re in a transitional state with limited operational history to rely on. Virtually everything we do is being challenged, from how we forecast demand to how we meet that demand. This move towards renewables is a real game-changer.”

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Kim Warren, IESO Vice President, Operations and Chief Operating Officer

Looking at the decade ahead, the state of the provincial supply mix will be influenced in large part by decisions around refurbishments at the Darlington and the Bruce Nuclear facilities, but also by new gas facilities in Napanee and Lambton, and large amounts of new renewable supply still to be commissioned. While the amount and frequency of SBG will depend on how these dynamics play out, the IESO is moving to ensure the system is managed efficiently, maximizing the value of the province’s investments in new supply.

NEXT: FLEXIBILITY COUNTS, PAGE 11



Banner year for the Bruce

A watershed year for electricity infrastructure expansion and renewal in the Bruce area, 2012 saw the completion of Hydro One's Bruce-to-Milton transmission line as well as the return to service of two units at the Bruce Power nuclear site after an extended lay-up period.

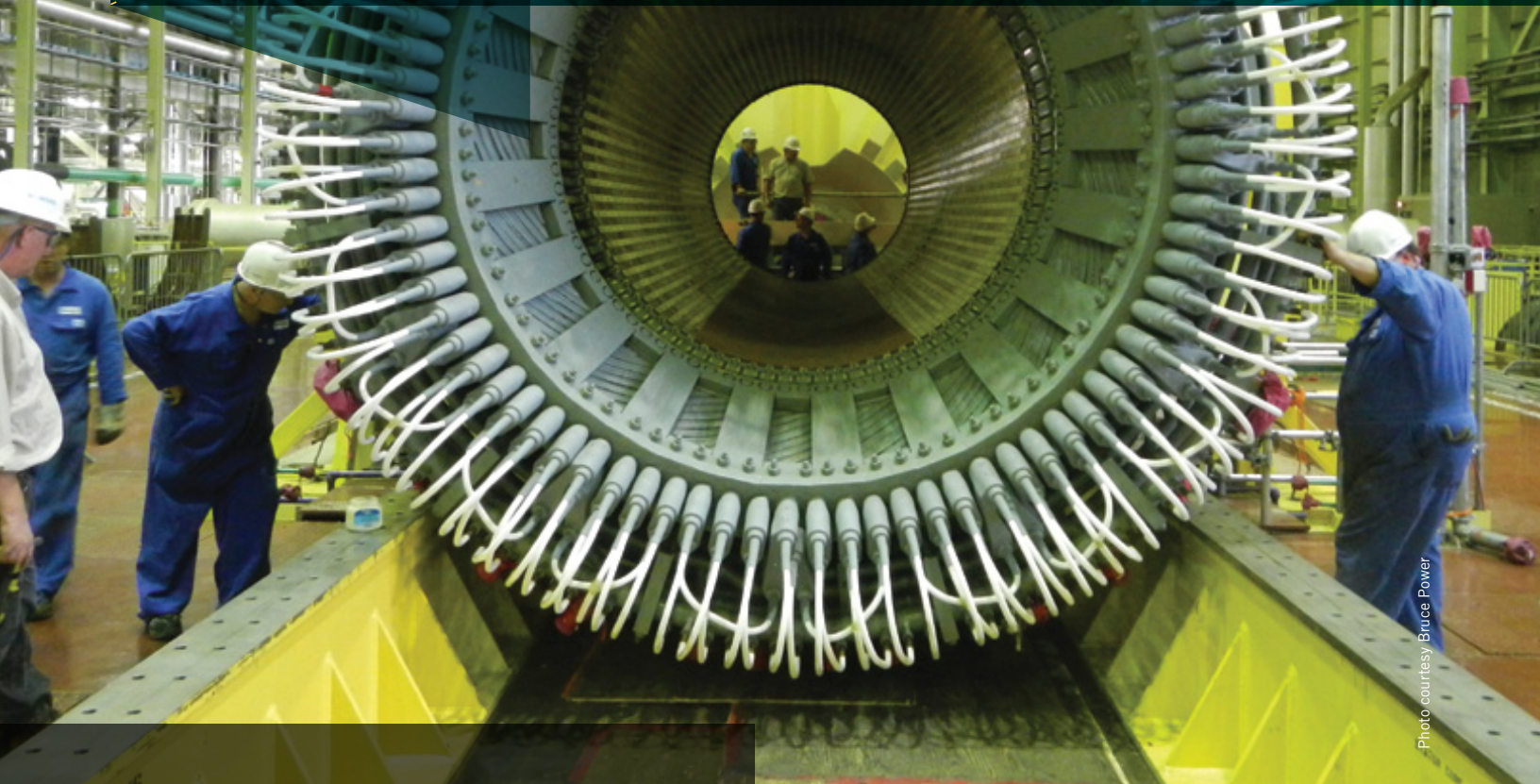


Photo courtesy Bruce Power

The 180-kilometre 500 kilovolt (kV) line, which stretches from Bruce Power's facility in Kincardine to Hydro One's switching station in Milton, was Ontario's most important grid upgrade in more than two decades. It has the capacity to transmit up to 3,000 megawatts (MW) of energy, and unlock the potential of nuclear, wind and solar projects in the region.

Working closely with Hydro One and the Ontario Power Authority (OPA), the IESO played a critical role in planning for the project. After several years of planning, analysis, modelling and regulatory proceedings, the Ontario Energy Board (OEB) granted Hydro One leave to construct the line in 2008.

Planning assumptions were challenged along the way by variables such as changes in demand for electricity, rapid-fire growth of renewable generation through the Feed-in Tariff (FIT) program, the accelerated phase-out of coal units, the need to develop a new special protection system, and a complex sequence of outages for construction that required close coordination within the IESO and among affected market participants.

Energy started flowing across the two circuits in late April and early May 2012. In the meantime, the IESO was also in regular contact with Bruce Power to determine what was required to reintegrate the two nuclear units that had been idle for more than 15 years. After being removed from service in the mid- to late-1990s, Units 1 and 2 at Bruce A were synchronized to the grid in fall of 2012, making the Bruce complex the world's largest operating nuclear facility.

At its peak, the Bruce A Restart project employed more than 3,000 contract employees completing thousands of tasks, including a complete overhaul of the turbine generators, as shown above. The result is two totally revitalized units that are expected to provide power to the province for another generation.

Changing timelines added a fresh complication to what were two highly complex undertakings. "These were massive projects and they challenged everyone involved," says Bruce Campbell, IESO Vice President, Resource Integration. "There were a lot of moving parts. But completion of the Bruce-to-Milton line and the restart of two units at Bruce Power will go a long way to ensuring Ontario continues to enjoy a reliable supply of electricity, when and where it's needed."

Flexibility counts

Electricity supply is measured in a number of ways – the total amount of energy a generator is capable of producing at full output (installed capacity); how much it actually produces (energy); and how much it produces compared to its installed capacity (capacity factor).

For system operations, flexibility is also a key metric. The ability of various fuel types to start, stop, quickly ramp up and ramp down production and control this output is increasingly necessary, but increasingly scarce in the IESO system.

In this regard, the growth of gas generation has played an important role in providing flexibility. Gas generators can ramp up and down production almost as quickly as their coal counterparts, but can be limited in other ways – particularly in how long and how much they must produce before providing ramp.

“As we’ve moved to replace coal in our system, we’ve learned a lot about the operating characteristics of the new supply. For example, gas units are basically highly sophisticated combustion engines and vastly different from the operations you would see in a coal power plant. The operating characteristics of each gas facility can be quite unique,” says Warren. “The changes we see in the seasonal operations of the gas fleet are diverse and with these changes comes a different set of challenges that we must learn to overcome.”

Traditionally, managing a power system involved a high degree of certainty and predictability. Demand followed established historical patterns, largely influenced by weather. Generating units were also dispatched with similar patterns, with ramping capability that could be relied on. So with a mix of historical practice and sound experience, system operators and the technical staff that

plan and prepare in advance of real-time operations, worked within a well-known set of scenarios.

Variable generation changes these fundamentals of power system management. A rapid decrease in wind output during the morning ramp could require even greater outputs from other generators to pick up the slack. Likewise, cloud cover in the middle of the day can momentarily reduce output at a solar farm, needing a fast-acting resource such as storage to fill the gap.

On one day in May of last year with roughly 1,700 MW of installed wind generation capacity, wind output rose roughly 500 MW in the space of 20 minutes. With 3,200 MW of renewable supply to be added to the system between now and the summer of 2014, these kinds of events could translate into increases of thousands of megawatts over short spaces of time. This is why the range of operational variables to be managed will be amplified over the coming years.

Yet what can seem to be unpredictable and inherently volatile is in reality a resource that, with the right tools and information, can be effectively harnessed to support reliability. Wind generators, within the limits of the wind availability, can be quite dispatchable – pitching the blades on a turbine can increase or decrease output almost instantly.

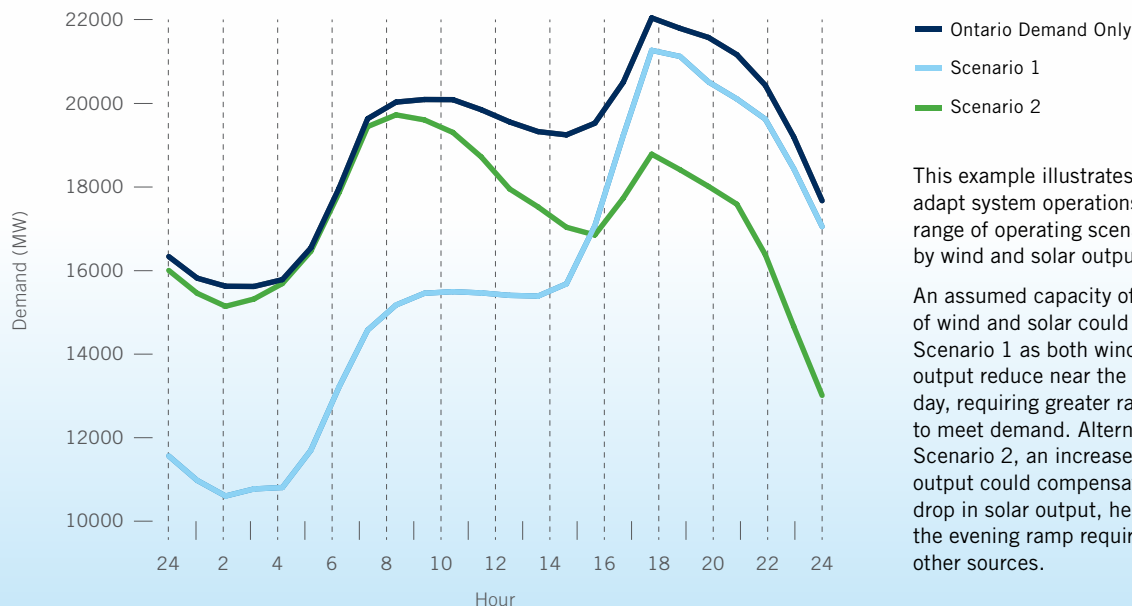
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“It’s been a learning experience for us all. Throughout this process, we’ve been working with wind developers to explore how to harness the full potential of wind generation within our system.”

Bruce Campbell
IESO Vice President,
Resource Integration

IMPACT OF WIND AND SOLAR OUTPUT ON SYSTEM NEEDS



This example illustrates the need to adapt system operations to a wider range of operating scenarios created by wind and solar output.

An assumed capacity of 7,600 MW of wind and solar could result in Scenario 1 as both wind and solar output reduce near the end of the day, requiring greater ramp capability to meet demand. Alternatively in Scenario 2, an increase in wind output could compensate for the drop in solar output, helping reduce the evening ramp requirement from other sources.

CONTINUED FROM PAGE 11

“It’s been a learning experience for us all,” says Bruce Campbell, IESO Vice President, Resource Integration. “Throughout this process, we’ve been working with wind developers to explore how to harness the full potential of wind generation within our system. Our job was not just to explain what we need them to do as generators, but also to change our tools and processes in order to most effectively use wind generation given its operating characteristics. Putting these in place will maximize the efficient operation of the system overall and position wind and solar on an even footing with other resources on the grid.”

In 2010, the IESO started the process of developing these tools and processes. By early 2012, a centralized wind forecast was initiated, providing a more accurate prediction of wind output over a 48-hour period. These forecasts help the IESO position the rest of the system in anticipation of wind output. By December, the accuracy of these forecasts was high, at 93 per cent for day-ahead projections, and almost 97 per cent an hour ahead.

The IESO will implement dispatch for wind generation in 2013 – in part, to address periods of Surplus Baseload Generation. In these cases, the IESO may also instruct nuclear generation to manoeuvre down – a capability that has increased through investments and enhancements at the Bruce facility that provide flexible capacity. Along with nuclear flexibility, the IESO would also dispatch wind to provide a more finely tuned response that can meet smaller changes in demand. The dispatch of wind could result in savings of up to

\$200 million in 2014, depending on the actual availability of flexible nuclear in real time. Integration into the dispatch and all associated systems and processes, means wind (and soon solar) becomes a more controllable resource within the provincial supply mix.

System processes and procedures alone won’t maximize the output from renewables. Two new potential sources of balancing capability are emerging – storage and demand response – that are poised to meet this critical need.

NEXT: STORING ELECTRICITY, PAGE 14

Enhanced Day-Ahead Commitment Process (EDAC) saves **\$13 - \$18.7 million** annually by providing more accurate unit commitment for gas generators, allowing them to purchase gas more effectively.

A shock absorber for the power system

Compact in size and built to stringent acoustic and emission control standards, the York Energy Centre plays a unique role in the management of Ontario's power system.

Ian Hunt, Plant Manager at Veresen Inc.'s York Energy Centre, says he's happy to pick up the slack when system conditions change suddenly and a quick response is required. "That's exactly what these units were designed and built to do," he explains. "As a simple cycle facility, we can get to full output in minutes, not hours."

While it only came into commercial operation in late May 2012, the York Energy Centre has been called into action twice as many times as originally envisioned, totalling more than 60 dispatches in 2012. As a 'peaker plant', the facility can play a number of different roles, such as responding to sudden changes in demand, backing up renewable generation, serving load under extreme weather conditions, or even replacing hydroelectric production when water levels are low. "In our first year of operation, we've had a 99 per cent availability rate, which means we're there when we're needed," says Hunt.

Photo courtesy
York Energy Centre

Storing electricity



For the last century, power systems have been built on the premise that electricity, at least in significant amounts, can't be stored.

As a result, it has been designed as a 'just-in-time' delivery system, producing electricity exactly when it's needed. This paradigm is about to be turned on its head. Storage technologies are being developed to fill in the emerging gap between when power is available and when power is needed.

From large-scale developments that store energy by pumping water, compressing air or producing hydrogen to smaller, fast acting, more modular resources like batteries and flywheels, storage will provide an ideal partner for variable resources that are reliant on the availability of the wind or the sun. Located properly, it can also help relieve congestion on transmission and distribution systems. It could provide operating reserve, potentially displacing peaking capacity. And as the IESO is learning, it can also provide regulation service, which helps fine-tune the second-by-second balance between supply and demand.

"Flywheel storage, for example, can respond much faster than conventional generation sources, enabling it to follow signals more accurately and return the electricity grid to a balanced state more quickly. Providing fast response storage for regulation service will also help manage the increased intermittent energy coming on the Ontario grid," says Annette Verschuren, Chair and Chief Executive Officer, NRStor Inc., and Chair of the Ontario Clean Energy Task Force.

"Barriers exist for the development and commercialization of these technologies – such as a lack of knowledge and understanding around the value of energy storage, rules that weren't designed to recognize the value of these new technologies and a shortage of standardized contracts."

Many of these technologies are still nascent, and as such, are not as cost competitive – at least not in the traditional sense – as mainstream suppliers. And that's the challenge. Storage is currently not a mainstream supplier and shouldn't be treated as such. Proponents argue that it can provide a number of different services that a traditional generator cannot. The challenge ahead is to attach an appropriate value to this flexibility and the overall benefit storage can provide to the system.

"It's hard to justify the expense of storage to meet just any one particular need," says Murphy. "But the expense may be justified given the multitude of benefits that storage provides, whether it's supplying electricity, providing energy at peak, optimizing variable supply sources, managing surpluses, and providing ramping capabilities. If we can find the

right way to incorporate storage in a way that takes advantage of these multiple benefits, it will open up so many new avenues for us as system operators."

Over the next year, the IESO will develop a methodology to evaluate the operational benefits of storage, identify where storage might provide the highest value on the system and determine how it can be integrated into the market. The outcome of this study could help plot out the future of storage in Ontario.

NEXT: A RESPONSIVE KIND OF DEMAND, PAGE 16

A delicate balancing act



If the regulation service landscape looks different these days, it's because the playing field is being levelled.

Regulation is a contracted service that acts to match total generation on the system with total demand on a second-by-second basis. By helping to correct small, sudden changes in power system frequency, it balances power flows and maintains the reliability of the power system. This quick response is becoming increasingly important to facilitate more renewable resources like wind and solar, whose output is variable in nature.

In a competitive process undertaken in 2012, the IESO selected three vendors to provide regulation, which is traditionally supplied by hydroelectric and thermal generators. The winning proponents include ENBALA Power Networks, NRStor Incorporated and Renewable Energy Systems Canada Inc. (RES Canada).

By opening the door to alternative technologies such as aggregated loads, flywheels and battery storage, the IESO has found a new role for the demand side of the market, and taken an important step to diversify its participant base. The IESO intends to use the next three years to learn about the performance of the new technologies. This experience is expected to yield valuable data that will be used to gauge the potential for other ways these types of resource can contribute to reliability in the future.

Replicating a model that's already providing regulation within PJM's service area, which spans 13 U.S. states plus the District of Columbia, ENBALA contracts with large electricity users to create an integrated network of demand response providers. Once a regulation signal is sent by the system operator, ENBALA's optimization engine sends an automated signal to participants – all while respecting their normal operating requirements to avoid interrupting critical processes. By leveraging the operational flexibility inherent in their respective operations to either produce or consume electricity, the network will supply up to 4 MW of regulation capacity when fully implemented.

NRStor's regulation offering works on an entirely different premise. Working with partners Temporal Power, NRStor plans to develop a 2 MW energy storage system using 10 flywheels, which convert the kinetic energy of a spinning mass into electrical energy. The system will be able to supply 2 MW of regulation as well as 500 kWh of storage capability. Flywheels have unique operating characteristics including a high ramp rate, the ability to "change direction" (produce or consume energy) quickly, plus an astonishingly quick response time to a regulation signal – they can reach 100 per cent of capacity in less than 250 milliseconds.

RES Canada, meanwhile, will build a 4 MW battery storage unit in Southwestern Ontario, home to a large number of Ontario's wind farms. At the heart of RES Canada's solution is a battery plus a power conditioning system, which simultaneously provides frequency response/regulation and reactive power capability.

Energy storage is often described as "the missing link" in the drive to extract maximum value from renewable resources. By offsetting the variability of wind output, storage will leverage existing infrastructure and enhance its efficiency.

A responsive kind of demand



While traditional system management practices have focused on matching supply to demand, new technologies are emerging to allow the reverse, enabling demand to match changes in supply.

Demand profiles have changed significantly in the province since the turn of the century. Since 2005, Ontario has consistently peaked in the summer, as Ontarians became increasingly reliant on air conditioning to get them through the summer months. In 2006, the province reached its all-time system record peak of 27,005 MW, on a very hot day in August when the thermometer hit 36°C. Demand peaks haven't come close since, even when temperatures have.

While the recession has accounted for some of this phenomenon, the growth in embedded generation, and greater conservation and demand response efforts have come together to produce these lower demand peaks. During the summer peak day in 2012, Ontario Power Authority programs like Demand Response 3 and changes to the allocation of the Global Adjustment resulted in industrial consumers alone being able to shave the demand on the hottest day of the year by at least 400 MW.

Already, the potential for demand response is apparent. The question is: can it do more? Unlike other resources, demand response allows markets to tap into existing infrastructure. The load already exists, the only investment needed is to unlock its potential.

Demand response has grown significantly over the last decade, particularly south of the border where system operators have opened up capacity and ancillary markets to loads. Some estimates put the potential for demand-side management in the U.S. at roughly 80,000 MW in 10 years or about seven per cent of the on-peak resources. Yet, this potential will likely only be fully realized outside the traditional electricity sector as private companies develop new applications and approaches to managing energy use.

Take the residential sector, as an example. Virtually every Ontario household is equipped with a smart meter, supported by the Meter Data Management and Repository, operated by the IESO to facilitate time-of-use (TOU) billing. This is only the first step toward the evolution of the smart home. And while consumers are starting to think about how they use energy differently, there are on the horizon a range of tools and services that have the potential to take demand response in the residential sector to a whole new level of sophistication. Programs such as the OPA's peaksaver PLUS have demonstrated how residential consumers can, without any significant effort on their part, help reduce peaks.

To this end, the IESO will be joining with the Corporate Partners Committee of the Ontario Smart Grid Forum as it establishes a Demand Side Management Task Force to gauge the potential for

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7 out of 10 Ontarians
say they've changed their
energy use behaviour
as a result of being on
time-of-use rates. (IESO-
SmartGrid Canada-2012)

100 million
meter reads a day by the
Meter Data Management
and Repository (MDM/R).



ONTARIO DEMAND PEAKS



27,005 MW
AUGUST 1, 2006

v.



24,636 MW
JULY 17, 2012

Keeping a close eye on grid conditions

"Better information means better reliability," says Art Skidmore, President and CEO at Halton Hills Hydro Inc. "Having near-real-time data means we can respond more quickly to irregularities and outages – plus the renewable energy we derive from the solar panels supports the town's community energy plan."

For local distribution companies, smart grid technologies are providing new avenues to improve electricity service to their customers. In the Town of Halton Hills, this means putting solar panels and accompanying monitoring equipment on the streets.

This initiative involves the installation of 200 solar panels on distribution poles throughout the town. In addition to injecting roughly 200 kilowatt-hours (kWh) of energy into the grid each day, the panels also house wireless monitoring, measurement and communications components that track line voltage, energy production and other variables and send alerts back to the Local Distribution Company's (LDC) office.

Halton Hills Hydro is one of many Ontario distributors investing in new infrastructure with smart grid capabilities that provide better insight into grid conditions, support efficient asset management decisions, and facilitate improved outage management and response. Indeed, the role of LDCs is rapidly evolving, setting the stage for them to become more dynamic in their operations and leverage the availability of demand response and embedded generation within their service areas.

Another LDC with a smart grid focus is PowerStream, which serves more than 355,000 customers to the north of Toronto, and was one of the first LDCs in North America to install "triage tools" that track and fix outages in minutes.

Oshawa PUC and Whitby Hydro are also moving forward together with smart technologies. The utilities are implementing an advanced outage management system and an enterprise web-based portal that shares business intelligence and geospatial data within their organizations and with their customers. This powerful new tool allows users to perform tasks that include identifying and tracking power outages, crew availability and restoration times; monitoring loadings on transformers to prevent equipment failure; and creating maps to identify problem areas. It is expected to increase customer satisfaction, achieve operational savings through shared costs, and build on LDCs' existing assets to support an intelligent, modernized distribution grid.



Photo courtesy Halton Hills Hydro Inc.



Refining the crystal ball

In the short space of two years, the process of electricity demand forecasting in the province has been turned upside down.

“Things were much simpler before,” explains David Short, Manager of Forecasts and Integration at the IESO. “We used to build our forecasts using weather-related data – with inputs like temperature, humidity, wind speed, illumination levels etc. – but there are a lot more variables to account for today.”

He points to a number of complicating factors, including shifting usage patterns resulting from time-of-use rates and the Global Adjustment allocation, the impacts of conservation and demand management programs, and the growth in embedded generation.

Because distribution-connected supply used to meet local demand effectively reduces demand for electricity on the bulk power system managed by the IESO, it needs to be factored into demand forecasts. But the tools used to select a ‘best similar day’ for forecasting purposes were built long before the recent surge in small-scale generation projects. And with embedded solar power in Ontario expected to grow exponentially in the coming years, what used to be considered “noise” by power system planners and operators is quickly becoming material, especially during the morning and evening ramp periods.

The IESO requires timely and accurate demand forecasts to ensure the reliability of Ontario’s power system, facilitate scheduling and dispatching of generation, and support market participants’ needs with respect to operational planning and risk management. The company’s forecasting functions have an enviable accuracy rate, ranging from 97% in long-term planning scenarios to 99% in real time.

Although dealing in a different timeframe for planning purposes, Senior Load Forecaster Andrew Trachsell agrees that predicting consumption has become far more complex and nuanced. “It’s an interesting exercise,” he says. “You’ve got the structural shift in the economy, the volatility of output from renewable generators, the growing impact of enabling smart grid technologies, and a consumer base that’s more sensitive to price. It all leads to greater forecast complexity – but we’re adapting our models to keep up with the changes.”

ONTARIO'S CHANGING DEMAND



CONTINUED FROM PAGE 16

demand response and identify the barriers that stand in its way. It will focus on how to empower consumers and ensure that demand response delivers specific benefits.

Many in the industry believe that consumers can offer a lot more than just peak shifting. With the right tools and services, they can provide more fine-tuned responses that could help to balance out variability. The challenge will be not only to make these technologies accessible but also to ensure that consumers perceive them to be worth the effort and investment.

“There are a variety of ways in which a residential consumer can become more responsive to the needs of the system,” says Professor Ian Rowlands, in the Faculty of Environment at the University of Waterloo. “Whether it’s home automation systems, connecting to a programmable thermostat using an app, or purchasing an electric vehicle, many options are emerging for consumers to consider. Yet the industry is struggling to develop value propositions for consumers and to communicate benefits

to them. This is the greatest barrier facing the adoption of those smart home technologies that will support more sophisticated levels of demand response.”

In many ways, the combination of the IESO’s wholesale market and the technologies to respond to price signals creates a perfect staging area for demand response. Prices provide the clearest signals of system needs – incenting participants to increase or reduce their use of energy.

“With the growing amount of variability in the system, we are going to see different dynamics in the market,” says Campbell. “Prices are less likely to rise and fall according to on-peak and off-peak requirements. Instead, they are more likely to be much more reflective of specific system needs at any one point of time – whether it’s to attract more demand response to help meet ramp, or to signal a surplus of energy.”

This kind of finely-tuned response will need finely-tuned prices. As noted by the IESO-sponsored Electricity Market Forum in late 2011, developing a higher fidelity energy price signal is necessary to encourage customer engagement.

In response, the IESO launched two stakeholder processes to look at the design of the Hourly Ontario Energy Price and the Global Adjustment to determine ways in which to increase price-responsiveness. This process includes in-depth studies of the mechanisms and components that drive both costs, with a view to developing a series of recommendations. The final reports are due out in summer 2013.

NEXT: LISTENING, RESPONDING AND ACTING
STAKEHOLDER ENGAGEMENT AT THE IESO PAGE 22

Protecting against the peaks



Paul Martin (r) Western University

When it comes to sustainability, Paul Martin makes no bones about being an idealist. “By reducing our overall energy consumption, we’re doing something that benefits all of Ontario,” says Martin, Director of Business Operations in the Facilities Management Department at Western University Canada in London. Martin is one of a growing cadre of energy managers who are changing the way their facilities use energy, representing a hidden power within the province’s consumer base to provide system flexibility.

With a summertime peak demand of 24 megawatts (MW) and a winter peak of 15 MW, the university is one of the largest energy users in the region. As such, Martin has developed a number of initiatives to achieve Western’s long-term goal of getting the summer peak down to about 18 MW.

For example, he closely watches for opportunities to mitigate against the costs associated with the Global Adjustment, which reflect each Class A consumer’s contribution to overall system demand during the five peak hours of a defined base period. Using the IESO’s peaktracker as well as weather forecasts, Martin prepares to curtail electricity usage at buildings across the campus when he thinks consumption might hit peak levels. By successfully identifying the five peak hours ahead of time, and curbing energy consumption on those dates, Martin figures the university saved nearly \$1,000,000 in 2012.

Western’s student body is also actively engaged in – and committed to – better managing their energy usage, as evidenced by a conservation challenge known as “Rez Powers Down.” For two weeks in late November 2012, students living in residence challenged each other to reduce their consumption in simple ways by turning down the thermostat, unplugging appliances at night, washing clothes in cold water, turning off unnecessary lights, taking shorter showers and using the stairs instead of the building elevators.

Progress was monitored and recorded using a real-time energy dashboard that shows current usage and historical data at each of the 93 buildings on the campus. By the end of the challenge period, total reductions from participating residences reached 38,710 kWh.

These kinds of actions by large users are already having a noticeable impact on demand for electricity. On hot summer days in 2012, for instance, Ontario’s overall demand profile was markedly flatter than in previous years, rising in the morning and holding until late evening. Gone are the sharp afternoon peaks at 4:00 p.m. This flattening effect can be attributed to a number of factors, including load shifting (using energy later in the day when prices are lower) and participation in formal demand response programs like DR3 and peaksaver PLUS.

This, however, is only the beginning. According to the Federal Energy Regulatory Commission, demand response capacity in the U.S. industrial and commercial sector has doubled in the last six years. The potential for demand response is still largely untapped. All that is needed is more organizations with the same kind of initiative and creativity as was demonstrated by Western.

Listening, responding and acting: stakeholder engagement at the IESO

 **The reviews of the Hourly Ontario Energy Price and Global Adjustment illustrate another evolution that is taking place within the industry – one which is changing the way stakeholders interact with each other.**

Since its inception, the IESO has consulted with market participants and other stakeholders on a variety of issues. In recent years, however, the IESO's market participant base has changed, bringing with it new players with very different perspectives.

Given the transformative nature of the change taking place, the IESO needs to ensure that it receives input early and often enough to ensure it develops the best possible solutions to address operational challenges. A case in point was the Renewable Integration Initiative. IESO staff found that a more comprehensive stakeholder process provided them with valuable insight into the operational capabilities of wind generators, that in turn informed some of the thinking behind wind dispatch.

"The IESO is well versed in what it takes to ensure operations are reliable. That's our ultimate responsibility," says Terry Young, IESO Vice President, Corporate Relations. "Our stakeholder processes allow us to take participants' feedback into account as we develop solutions to address system and market concerns. We look to our partners in the industry to bring their expertise and knowledge to the table to help work out the best approaches."

"We look to our partners in the industry to bring their expertise and knowledge to the table to help work out the best approaches."

Terry Young, IESO Vice President,
Corporate Relations

For example, the Market Information Focus Group is gathering insights from market participants and other heavy users of IESO data about what kind of data they need and how it should be presented. These insights become particularly useful as the IESO contemplates the provision of new data or revamping its website.

"One of the benefits I've received is a greater awareness of the complexity and the number of issues in the sector. If you are like us, we are only generally involved in one narrow aspect of the market so stakeholder consultation helps put things in a broader context," says Ersilia Serafini, CEO of Summerhill and a member of the IESO's Stakeholder Advisory Committee, representing Electricity Service Providers. "Regardless of what the final decision is, the ability to participate in the discussion is hugely helpful."

NEXT: A UNIQUE POSITION, PAGE 24



eso

Power to Ontario. On Demand.

Given the transformative nature of the change taking place, the IESO needs to ensure that it receives input early and often enough to ensure it develops the best possible solutions to address operational challenges.

IESO Stakeholder Summit

A unique position



As the connecting hub of the provincial power system, the IESO bears a number of responsibilities.

First and foremost, it is to ensure reliability of the electricity system – at all times. Whether it's enhancing existing systems used to manage the grid to provide more operational awareness; focusing resources on ensuring market participant compliance with reliability standards; or stepping up its cybersecurity efforts, the IESO is taking significant steps to maintain and even increase its capabilities in this core function.

This approach is also reflected in the work being done to support a younger and more diverse employee base. As more experienced staff move on to retire, expanded training and mentoring programs are key to ensuring that this critical transfer in knowledge takes place.

Yet the IESO needs to do more than retain existing expertise. It needs to expand its knowledge base. Today, IESO employees need, and have, a much broader set of skills and competencies – in information technology, economics, and soft skills such as customer service – all of which are needed as the electricity system embraces the digital age.

Another important IESO responsibility is to deliver maximum value to ratepayers. Over the years, the IESO has effectively managed its costs, which has resulted in its fee decreasing from \$0.959/MWh in 2003 to \$0.822/MWh for 2012.

“Over the years, we’ve built a culture of fiscal restraint and prudent spending that has once again produced strong results,” said Ted Leonard, IESO Vice President, Finance and Chief Financial Officer. “Our approach to managing costs carefully is just one of the many ways in which we aim to maintain the trust of market participants, stakeholders and, ultimately, ratepayers.”

NEXT: A FUNDAMENTAL SHIFT, PAGE 26

“Over the years, we’ve built a culture of fiscal restraint and prudent spending that has once again produced strong results.”

Ted Leonard, IESO Vice President, Finance and Chief Financial Officer



Renewal from the inside out

For an organization with a legacy spanning across a century, the IESO has a remarkably young workforce. With an average age of 44 years, 53 per cent of staff have been with the organization for less than 10 years – quite the transition for an industry that traditionally hired employees straight out of school and retained them from the start of their careers to the end.

As increasing numbers of experienced staff leave the workforce for retirement, they take with them an enormous amount of on-the-job experience, specialized knowledge and technical expertise. These assets and competencies are not acquired overnight, according to Michelle Branigan, CEO of Electricity Human Resources Canada (EHRC), a not-for-profit organization founded in 2005 to provide labour market data and analysis and offer practical support to industry employers in areas like recruiting and retention.

“Our industry is highly educated and highly skilled,” Branigan explains. “The lead times to achieve full competency in any given role are long – so knowledge transfer and knowledge management are absolutely critical.”

The required skill set for employees working in the sector has also evolved to include a much greater emphasis on soft skills like communication, negotiation, problem solving and customer focus. “It’s not sufficient to be technically competent anymore,” explains John Rattray, Manager,

Employee and Labour Relations at the IESO. “In a changing, dynamic world, you need to be flexible. You also need to be able to work effectively within a team – not just with colleagues in your own department or business unit but with stakeholders across the broader industry.”

The IESO has taken this shift in core competencies to heart. The company is making every effort to position itself well for the future ensuring it has the right people with the right skills in the right roles. For example, training and development now adheres to the 70/20/10 model of adult learning, where 70 per cent of learning is acquired through practical, on-the-job experience; 20 per cent comes via feedback from peers, supervisors and mentors; and 10 per cent is delivered by traditional means including conferences and courses.

Like every other company in the sector, the IESO is competing for talent. EHRC data suggest the tight labour market in Canada will continue for the next few years at least, as experienced employees retire, leaving some 45,000 vacancies in the electricity sector to be filled by 2016 – 50 per cent of which are in critical occupations including power system operators, utility managers, IT analysts and consultants, and the trades, including construction, industrial mechanics and power line maintenance.

To attract and retain this talent, the IESO has developed a multi-faceted employee value proposition. “We invest in – and partner with – our employees at all points in their career path,” Rattray explains. “From recruiting bright and adaptable students into our co-op program, to offering interesting assignments and rotations, to developing leadership skills at all levels of the organization, we’re doing what we can to ensure we have the right mix of people now and for the future.”

NO DAY IS LIKE ANOTHER

A fundamental shift



The electricity sector in Ontario has changed in more ways than most people recognize.

While smoke stacks at coal plants sit idle, and wind and solar farms dot the landscape, other fundamental changes have taken place behind the scenes in the way the many parts that make up the system interact with each other. It is a much more dynamic, diverse and diffuse system. And it will only continue to become more so.

Over the next decade, Ontario will have a unique mix of sustainable resources, leading-edge system management tools to support reliability, a consumer base primed for more sophisticated levels of demand response and a burgeoning clean tech sector that will drive innovations for use here in Ontario and abroad.

And as this shift from a centrally-controlled, uniform system to a more fluid approach to electricity service moves forward, the IESO is working to ensure this transition occurs reliably and efficiently. The key will be for the industry to envision how this transformation will continue to unfold, and unearth opportunities beyond traditional boundaries. It's a discussion the IESO and others are starting to engage in.



Big changes at the Beck

Deep under the streets of Niagara Falls, Ontario, water will soon start flowing down a 10.2-kilometre tunnel to the Sir Adam Beck Generating Complex. When completed later in 2013, Ontario Power Generation's Niagara Tunnel Project will increase the output of clean, renewable energy from the plant by about 14 per cent.

Water volumes available to Canada for generation purposes vary from about 1,000 to 3,000 cubic metres per second. Once the tunnel is in service, OPG will be able to divert substantially more water into its turbines – a marked increase in efficiency.

The actual amount of energy produced each year will depend on river flows and demand for electricity. Propelled by gravity alone, some 500 cubic metres per second (or 500,000 litres per second) will flow through the 14.4-metre wide tunnel – enough to fill an Olympic-size swimming pool in a few seconds, and meet the electricity needs of approximately 160,000 homes.

Photo courtesy Ontario Power Generation

FINANCIAL STATEMENTS

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Management Report

Management's Responsibility for Financial Reporting

The accompanying financial statements of the Independent Electricity System Operator are the responsibility of management and have been prepared in accordance with Canadian public sector accounting standards. The significant accounting policies followed by the Independent Electricity System Operator are described in the Summary of Significant Accounting Policies contained in Note 2 in the financial statements. The preparation of financial statements necessarily involves the use of estimates based on management's judgement, particularly when transactions affecting the current accounting period cannot be finalized with certainty until future periods. The financial statements have been prepared within reasonable limits of materiality and in light of information available up to February 15, 2013.

Management maintained a system of internal controls designed to provide reasonable assurance that the assets were safeguarded and that reliable information was available on a timely basis. The system included formal policies and procedures and an organizational structure that provided for the appropriate delegation of authority and segregation of responsibilities.

These financial statements have been examined by KPMG LLP, a firm of independent external auditors appointed by the Board of Directors. The external auditors' responsibility is to express their opinion on whether the financial statements are fairly presented in accordance with generally accepted accounting principles in Canada. The Auditors' Report, which follows, outlines the scope of their examination and their opinion.

INDEPENDENT ELECTRICITY SYSTEM OPERATOR

On behalf of management,



Paul Murphy
President and Chief Executive Officer
Toronto, Canada
February 15, 2013



Ted Leonard
Vice President, Finance
Chief Financial Officer and Treasurer
Toronto, Canada
February 15, 2013

Independent Auditors' Report

To the Board of Directors of the Independent Electricity System Operator (IESO)

We have audited the accompanying financial statements of IESO, which comprise the statement of financial position as at December 31, 2012, the statements of operations and accumulated deficit, remeasurement gains and losses, change in net debt and cash flows for the year then ended, and notes, comprising a summary of significant accounting policies and other explanatory information.

Management's Responsibility for the Financial Statements

Management is responsible for the preparation and fair presentation of these financial statements in accordance with Canadian public sector accounting standards, and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

Auditors' Responsibility

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on our judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, we consider internal control relevant to the entity's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Opinion

In our opinion, the financial statements present fairly, in all material respects, the financial position of IESO as at December 31, 2012, and its results of operations and the changes in its net debt and its cash flows for the year then ended in accordance with Canadian public sector accounting standards.



Chartered Accountants, Licensed Public Accountants

February 15, 2013

Waterloo, Canada

Statement of Financial Position

As at (in thousands of Canadian dollars)

December 31, 2012 December 31, 2011

	\$	\$
FINANCIAL ASSETS		
Cash and cash equivalents	6,863	5,626
Accounts receivable	16,833	14,135
Long-term investments (Note 3)	27,721	24,341
TOTAL FINANCIAL ASSETS	51,417	44,102
LIABILITIES		
Accounts payable and accrued liabilities (Note 4)	21,308	20,142
Accrued interest on debt	346	325
Rebates due to market participants (Note 5)	13,107	3,517
Debt (Note 6)	133,200	110,200
Accrued pension liability (Note 7)	41,600	54,928
Accrued liability for employee future benefits other than pension (Note 7)	69,255	64,541
TOTAL LIABILITIES	278,816	253,653
NET DEBT	(227,399)	(209,551)
NON-FINANCIAL ASSETS		
Net tangible capital assets (Note 8)	87,607	87,902
Prepaid expenses	3,688	3,103
TOTAL NON-FINANCIAL ASSETS	91,295	91,005
ACCUMULATED SURPLUS/(DEFICIT)		
Accumulated deficit from operations (Note 5)	(137,651)	(118,172)
Accumulated remeasurement gains/(losses)	1,547	(374)
ACCUMULATED DEFICIT	(136,104)	(118,546)

On behalf of the Board:



Tim O'Neill
Chair
Toronto, Canada



William Museler
Director
Toronto, Canada

Statement of Operations and Accumulated Deficit

For the year ended December 31 (in thousands of Canadian dollars)

	2012	2012	2011
	Budget \$	Actual \$	Actual \$
WHOLESALE MARKET OPERATIONS			
System fees	128,609	116,257	112,903
Other revenue (Note 9)	4,073	3,958	3,494
Interest and investment income	836	350	1,403
Wholesale market operation revenues	133,518	120,565	117,800
Wholesale market operation expenses (Note 10)	(128,608)	(116,727)	(116,290)
Wholesale market operations annual surplus	4,910	3,838	1,510
MARKET SANCTIONS AND PAYMENT ADJUSTMENTS			
Market sanctions and payment adjustments	–	1,087	39
Customer education and market enforcement expenses (Note 10)	(300)	(670)	(219)
Market sanctions and payment adjustments annual surplus/(deficit)	(300)	417	(180)
SMART METERING ENTITY			
Smart metering charge	41,587	–	–
Smart metering expenses (Note 10)	(29,113)	(23,734)	(16,911)
Smart metering entity annual surplus/(deficit)	12,474	(23,734)	(16,911)
ANNUAL SURPLUS/(DEFICIT)	17,084	(19,479)	(15,581)
ACCUMULATED DEFICIT FROM OPERATIONS, BEGINNING OF PERIOD	(118,172)	(118,172)	(102,591)
ACCUMULATED DEFICIT FROM OPERATIONS, END OF PERIOD	(101,088)	(137,651)	(118,172)

Statement of Remeasurement Gains and Losses

For the year ended December 31 (in thousands of Canadian dollars)	2012	2011
	Actual \$	Actual \$
ACCUMULATED REMEASUREMENT LOSSES, BEGINNING OF PERIOD	(374)	—
UNREALIZED GAINS/(LOSSES) ATTRIBUTABLE TO:		
Foreign exchange – derivatives	—	2
Foreign exchange – other	35	46
Portfolio investments (Note 3)	1,025	(422)
AMOUNTS RECLASSIFIED TO THE STATEMENT OF OPERATIONS:		
Foreign exchange – derivatives	(2)	—
Foreign exchange – other	(46)	—
Portfolio investments	909	—
NET REMEASUREMENT GAINS/(LOSSES) FOR THE PERIOD	1,921	(374)
ACCUMULATED REMEASUREMENT GAINS/(LOSSES), END OF PERIOD	1,547	(374)

Statement of Change in Net Debt

For the year ended December 31 (in thousands of Canadian dollars)	2012	2012	2011
	Budget \$	Actual \$	Actual \$
ANNUAL SURPLUS/(DEFICIT)	17,084	(19,479)	(15,581)
CHANGE IN NON-FINANCIAL ASSETS			
Acquisition of tangible capital assets	(20,767)	(16,244)	(14,787)
Amortization of tangible capital assets	18,541	16,539	15,427
Change in prepaid expenses	(9)	(585)	666
TOTAL CHANGE IN NON-FINANCIAL ASSETS	(2,235)	(290)	1,306
NET REMEASUREMENT GAINS/(LOSSES) FOR THE PERIOD	801	1,921	(374)
CHANGE IN NET DEBT	15,650	(17,848)	(14,649)
NET DEBT, BEGINNING OF PERIOD	(209,551)	(209,551)	(194,902)
NET DEBT, END OF PERIOD	(193,901)	(227,399)	(209,551)

Statement of Cash Flows

For the year ended December 31 (in thousands of Canadian dollars)

2012

2011

	\$	\$
OPERATING TRANSACTIONS		
Annual Deficit	(19,479)	(15,581)
Changes in non-cash items:		
Amortization	16,539	15,427
Pension expense	11,985	14,316
Other employee future benefits expense	6,482	6,125
Change in fair value of long-term investments	876	–
	35,882	35,868
Changes in non-cash balances related to operations:		
Change in accounts payable and accrued liabilities	1,138	(585)
Change in accounts receivable	(2,698)	1,620
Change in rebates due to market participants	9,590	(6,676)
Change in prepaid expenses	(585)	666
	7,445	(4,975)
Other:		
Contribution to pension fund	(25,313)	(27,254)
Payment of employee future benefits	(1,768)	(1,806)
	(27,081)	(29,060)
Cash applied to operating transactions	(3,233)	(13,748)
CAPITAL TRANSACTIONS		
Acquisition of tangible capital assets	(16,244)	(14,787)
Change in accounts payable & accrued liabilities	47	(1,547)
Cash applied to capital transactions	(16,197)	(16,334)
INVESTING TRANSACTIONS		
Purchase of long-term investments	(2,322)	(2,947)
Cash applied to investing transactions	(2,322)	(2,947)
FINANCING TRANSACTIONS		
Issue debt	23,000	30,000
Cash provided by financing transactions	23,000	30,000
INCREASE/(DECREASE) IN CASH AND CASH EQUIVALENTS	1,248	(3,029)
CASH AND CASH EQUIVALENTS – BEGINNING OF PERIOD	5,626	8,609
Change in unrealized foreign exchange – other for the period	(11)	46
CASH AND CASH EQUIVALENTS – END OF PERIOD	6,863	5,626

Notes to Financial Statements

1. NATURE OF OPERATIONS

Independent Electricity System Operator (IESO) is a not-for-profit, non-taxable corporation, created by statute effective on April 1, 1999 pursuant to Part II of the *Electricity Act, 1998*. As set out in the *Electricity Act, 1998*, the IESO operates pursuant to a licence granted by the Ontario Energy Board (OEB). The objects of the IESO as contained in the *Electricity Act, 1998* and amended, in the *Electricity Restructuring Act, 2004* and Ontario Regulation 452/06, are as follows:

- to exercise the powers and perform the duties assigned to the IESO under the *Electricity Restructuring Act, 2004*, the market rules and its licence;
- to enter into agreements with transmitters giving the IESO the authority to direct the operation of their transmission systems;
- to direct the operation and maintain the reliability of the IESO-controlled grid to promote the purposes of the *Electricity Restructuring Act, 2004*;
- to participate in the development, by any standards authority, of standards and criteria relating to the reliability of the transmission systems;
- to work with the responsible authorities outside Ontario to co-ordinate the IESO's activities with their activities;
- to collect and provide information to the Ontario Power Authority (OPA) and the public relating to the current and short-term electricity needs of Ontario and the adequacy and reliability of the integrated power system to meet those needs;
- to operate the IESO-administered markets to promote the purposes of the *Electricity Restructuring Act, 2004*;
- to plan, manage and implement the smart metering initiative or any aspect of the initiative;
- to oversee, administer and deliver the smart metering initiative or any aspect of the initiative; and
- to establish and enforce standards and criteria relating to the reliability of transmission systems.

The IESO was designated the Smart Metering Entity by Ontario Regulation 393/07 under the *Electricity Act, 1998* on March 28, 2007. The regulation came into effect on July 26, 2007.

The objects of the Smart Metering Entity (SME), as contained in the *Electricity Act, 1998*, are as follows:

- to plan and implement and, on an ongoing basis, oversee, administer and deliver any part of the smart metering initiative as required by regulation under this or any Act or directive made pursuant to sections 28.3 or 28.4 of the Ontario Energy Board Act, 1998, and, if so authorized, to have the exclusive authority to conduct these activities;
- to collect and manage and to facilitate the collection and management of information and data and to store the information and data related to the metering of consumers' consumption or use of electricity in Ontario, including data collected from distributors and, if so authorized, to have the exclusive authority to collect, manage and store the data;
- to establish, to own or lease and to operate one or more databases to facilitate collecting, managing, storing and retrieving smart metering data;
- to provide and promote non-discriminatory access, on appropriate terms and subject to any conditions in its licence relating to the protection of privacy, by distributors, retailers, the OPA and other persons,
 - i. to the information and data referred to above, and
 - ii. to the telecommunication system that permits the Smart Metering Entity to transfer data about the consumption or use of electricity to and from its databases, including access to its telecommunication equipment, systems and technology and associated equipment, systems and technologies

- to own or to lease and to operate equipment, systems and technology, including telecommunication equipment, systems and technology that permit the Smart Metering Entity to transfer data about the consumption or use of electricity to and from its databases, including owning, leasing or operating such equipment, systems and technology and associated equipment, systems and technologies, directly or indirectly, including through one or more subsidiaries, if the Smart Metering Entity is a corporation;
- to engage in such competitive procurement activities as are necessary to fulfill its objects or business activities;
- to procure, as and when necessary, meters, metering equipment, systems and technology and any associated equipment, systems and technologies on behalf of distributors, as an agent or otherwise, directly or indirectly, including through one or more subsidiaries, if the Smart Metering Entity is a corporation;
- to recover, through just and reasonable rates, the costs and an appropriate return approved by the Ontario Energy Board associated with the conduct of its activities; and
- to undertake any other objects that are prescribed by associated regulation.

The IESO is required to submit its proposed expenditures, revenue requirements, and fees for the coming year to the OEB for review and approval. The submission may be made only with the approval or deemed approval of the IESO business plan by the Minister of Energy (Minister).

2. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

a) Basis of financial statement preparation

The accompanying financial statements have been prepared on a going concern basis and in accordance with Canadian public sector accounting standards and reflect the following significant accounting policies:

b) Revenue recognition

System fees earned by the IESO are based on approved rates for each megawatt of electricity withdrawn from the IESO-controlled grid, including exports. System fees are recognized as revenue at the time the electricity is withdrawn. Rebates are recognized in the year in which the approved regulatory deferral account, before such rebates, exceeds regulated limits.

These financial statements do not include the financial transactions of market participants within the IESO-administered markets.

Other revenue represents amounts that accrue to the IESO relating to services the IESO performs and charges on a recovery basis, investment income on funds passing through market settlement accounts, as well as application fees. Such revenue is recognized as it accrues.

Interest and investment income represents realized interest income and investment gains or losses on cash, cash equivalents, short-term investments and long-term investments.

Market sanctions represent funds received and payments disbursed related to penalties, damages, fines and payment adjustments arising from resolved settlement disputes.

c) Financial instruments

The IESO records cash and cash equivalents, investment portfolio, and foreign currency exchange forward contracts at fair value. While held by the IESO, the cumulative change in fair value of these financial instruments is recorded in accumulated surplus as remeasurement gains and losses and is included in the value of the respective financial instrument shown in the statement of financial position and the statement of remeasurement gains and losses. Upon disposition of the financial instrument, the cumulative remeasurement gains and losses are reclassified to the statement of operations and all other gains and losses associated with the disposition of the financial instrument are recorded in the statement of operations. Transaction costs are charged to operations as incurred.

Cash and cash equivalents comprise cash, term deposits and other short-term, highly-rated investments with original maturity dates of less than 90 days.

The IESO records accounts receivable, accounts payable and debt at amortized cost.

d) Tangible capital assets

Tangible capital assets are recorded at cost which includes all amounts directly attributable to the acquisition, construction, development or betterment of the asset. The IESO capitalizes applicable interest as part of the cost of tangible capital assets.

e) Assets under construction

Assets under construction generally relates to the costs of physical facilities, hardware and software, and includes costs paid to vendors, internal and external labour, consultants and interest related to funds borrowed to finance the project. Costs relating to assets under construction are transferred to tangible capital assets when the asset under construction is deemed to be ready for use.

f) Amortization

The capital cost of tangible capital assets in service is amortized on a straight-line basis over their estimated service lives.

The estimated service lives in years, from the date the assets were acquired, are:

Class	Estimated Average Service Life 2012	Estimated Average Service Life 2011
Facilities	38	39
Market systems and applications	4 to 11	4 to 10
Infrastructure and other assets	4 to 7	4 to 7
Meter data management/repository	10	10

Gains and losses on sales or premature retirements of tangible capital assets are charged to operations.

The estimated service lives of tangible capital assets are subject to periodic review. The impacts of changes in the estimated lives are amortized on a prospective basis. The most recent review was completed in fiscal 2012.

g) Pension, other post-employment benefits and compensated absences

The IESO's post-employment benefit programs include pension, group life insurance, health care, long-term disability and workers compensation benefits.

The IESO accrues obligations under pension and other post-employment benefit (OPEB) plans and the related costs, net of plan assets. Pension and OPEB expenses and obligations are determined annually by independent actuaries using the projected benefit method and management's best estimate of expected return on plan assets, salary escalation, retirement ages of employees, mortality and expected health-care costs. The discount rate used to value liabilities is based on the expected rate of return on plan assets as at the measurement date of September 30.

The expected return on plan assets is based on management's long-term best estimate using a market-related value of plan assets. The market-related value of plan assets is determined using the average value of assets over five years as at the measurement date of September 30.

Pension and OPEB expenses are recorded during the year in which employees render services. Pension and OPEB expenses consist of current service costs, interest expense on liabilities, expected return on plan assets and the cost of plan amendments in the period. Actuarial gains/(losses) arise from, among other things, the difference between the actual rate of return on plan assets for a period and the expected long-term rate of return on plan assets for that period or from changes in actuarial assumptions used to determine the accrued benefit obligations. Actuarial gains/(losses) are amortized over the expected average remaining service life of the employees covered by the plan.

The expected average remaining service life of employees covered by the pension plans is 13 years (2011 – 12 years) and OPEB plans is 14 years (2011 – 12 years).

The IESO sick pay benefits accumulate but do not vest. The IESO accrues sick pay benefits based on the expectation of future utilization, and records the accrual within accounts payable and accrued liabilities.

h) Foreign currency exchange

Transactions denominated in foreign currencies are translated into Canadian dollars at the rate of exchange prevailing on the date of the transaction. Items on the statement of financial position denominated in foreign currency are translated to Canadian dollars at the rate of exchange as of the financial statements date. The cumulative unrealized foreign currency exchange gains and losses of items continuing to be recognized on the statement of financial position are recorded in accumulated deficit as remeasurement gains and losses and shown in the statement of financial position and the statement of remeasurement gains and losses. Upon settlement of the item denominated in a foreign currency, the cumulative remeasurement gains and losses are reclassified to the statement of operations and all other gains and losses associated with the disposition of the financial instrument are recorded in the statement of operations.

i) Use of estimates

The preparation of the financial statements in conformity with Canadian public sector accounting standards requires management to make estimates and assumptions that affect the reported amounts of revenues, expenses, assets and liabilities and the disclosure of contingent assets and liabilities as at the date of the financial statements. The IESO's accounts which involve a greater degree of uncertainty include the carrying values of tangible capital assets, rebates to market participants, accrued pension liability, and accrual for employee future benefits other than pensions. Actual results could differ from those estimates.

3. LONG-TERM INVESTMENTS

Long-term investments in a balanced portfolio of pooled funds are valued by the pooled funds manager based on published price quotations and amount to \$27,721 thousand (2011 – \$24,341 thousand). As at December 31, the market value allocation of these long-term investments was 60.5% equity securities and 39.5% debt securities (2011 – 58.8% and 41.2% respectively).

Balanced portfolio of pooled funds

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Opening balance	24,341	21,816
Purchase of investments	1,170	1,627
Reinvested distributions	1,152	1,320
Change in fair value	1,058	(422)
Closing balance	27,721	24,341

4. ACCOUNTS PAYABLE AND ACCRUED LIABILITIES

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Relating to operations	19,086	17,967
Relating to tangible capital assets	2,222	2,175
	21,308	20,142

5. REBATES DUE TO MARKET PARTICIPANTS AND ACCUMULATED DEFICIT

In 2012, the IESO recognized \$9,590 thousand in rebates due to market participants of system fees (2011 – \$11,617 thousand), due to net operating surplus in 2012. As at December 31, 2012 rebates due to market participants were \$13,107 thousand (2011 \$3,517 thousand). The IESO's approved regulatory deferral account balance is maintained at a maximum of \$5.0 million.

As at December 31, the components of the accumulated deficit were as follows:

Accumulated Deficit

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Regulatory deferral account (a)	5,000	5,000
Accumulated market sanctions and payment adjustments (b)	1,371	954
Smart metering entity – accumulated deficit (c)	(82,358)	(58,624)
PSAB transition items (d)	(60,117)	(65,876)
Accumulated deficit – end of year	(136,104)	(118,546)

a) Approved Regulatory Deferral Account

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Accumulated surplus – beginning of year	5,000	10,643
Revenues (before rebates due to market participants)	130,155	129,417
Rebates due to market participants	(9,590)	(11,617)
Wholesale market operation expenses	(116,727)	(116,290)
Change in accumulated remeasurement gains/(losses)	1,921	(374)
Recovery of PSAB transition items	(5,759)	(6,779)
Accumulated surplus – end of year	5,000	5,000

b) Accumulated Market Sanctions and Payment Adjustments

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Accumulated surplus – beginning of year	954	1,134
Market sanctions and payment adjustments	1,087	39
Customer education and market enforcement expenses	(670)	(219)
Accumulated surplus – end of year	1,371	954

c) Smart Metering Entity – Accumulated Deficit

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Accumulated deficit – beginning of year	(58,624)	(41,713)
Smart metering expenses	(23,734)	(16,911)
Accumulated deficit – end of year	(82,358)	(58,624)

d) PSAB Transition Items – Accumulated Deficit

As at December 31 (in thousands of Canadian dollars)	2012	2011
	\$	\$
Accumulated deficit – beginning of year	(65,876)	(72,655)
Recovery of PSAB transition items	5,759	6,779
Accumulated deficit – end of year	(60,117)	(65,876)

The IESO includes a portion of the accumulated deficit resulting from the PSAB transition items in the annual proposed expenditures to the OEB for recovery through system fees.

6. DEBT

Note payable to Ontario Electricity Financial Corporation (OEFC)

In May 2011, the IESO entered into a two-year note payable with the OEFC. The note payable is unsecured, bears interest at a fixed rate of 2.245% per annum and is repayable in full on May 1, 2013. Interest accrues daily and is payable in arrears semi-annually in May and November of each year. As at December 31, 2012, the note payable to the OEFC was \$78.2 million (December 31, 2011 – \$78.2 million).

For the year ended December 31, 2012, the interest expense on the note payable was \$1,756 thousand (2011 – \$1,501 thousand)

Credit facility

The IESO has an unsecured credit facility agreement with the OEFC, which will make available to the IESO an amount up to \$110.0 million. Advances up to \$60.0 million are payable at a variable interest rate equal to the Province of Ontario's cost of borrowing for a 30 day term plus 0.25% per annum, with repayments and interest payments due monthly. Advances above \$60.0 million and up to \$110.0 million are payable at a variable interest rate equal to the Province of Ontario's cost of borrowing for a 30 day term plus 0.50% per annum, with repayments and interest payments due monthly. The credit facility expires April 30, 2013. As at December 31, 2012, \$55.0 million was drawn on the credit facility (December 31, 2011 – \$32.0 million).

For the year ended December 31, 2012, the interest expense on the credit facility was \$505 thousand (2011 – \$210 thousand).

As of February 15, 2013, the IESO is in the process of refinancing its debt with the OEFC and is confident this will be in place for May 1, 2013.

7. POST-EMPLOYMENT BENEFIT PLANS

The IESO provides pension and other employee post-employment benefits, comprising group life insurance, long-term disability and group medical and dental plans, for the benefit of current and retired employees.

Pension plans

The IESO provides a contributory defined benefit, indexed, registered pension plan. In addition to the funded, registered, pension plan, the IESO provides certain non-registered defined benefit pensions through an unfunded, indexed, non-registered plan.

Other employee future benefits

The group life insurance, long-term disability and group medical and dental benefits are provided through unfunded, non-registered defined benefit plans.

Summary of accrued benefit obligations and plan assets

(in thousands of Canadian dollars)	2012 Pension Benefits	2011 Pension Benefits	2012 Other Benefits	2011 Other Benefits
	\$	\$	\$	\$
Accrued benefit obligation	405,323	388,808	71,715	67,091
Fair value of plan assets	360,017	306,055	–	–
Funded status as of measurement date	(45,306)	(82,753)	(71,715)	(67,091)
Employer contribution/other benefits payments after measurement date	4,314	8,679	480	469
Unrecognized actuarial (gain)/loss	(608)	19,146	1,980	2,081
Accrued pension liability recognized in the statement of financial position	(41,600)	(54,928)	(69,255)	(64,541)

Registered pension plan assets

As at the measurement date of September 30, registered pension plan assets were split by fair value between the following categories:

	2012	2011
Canadian equity securities	19.3%	18.6%
Foreign equity securities	38.9%	36.6%
Canadian debt securities	40.5%	44.9%
Cash equivalents	1.0%	1.1%
Forward foreign exchange contracts	0.3%	(1.2%)
	100.0%	100.0%

Principal assumptions used to calculate benefit obligations are determined at the end of the period and are as follows:

	2012 Pension Benefits	2011 Pension Benefits	2012 Other Benefits	2011 Other Benefits
Discount rate at end of the period	6.50%	6.50%	6.50%	6.50%
Rate of compensation increase	4.00%	4.00%	4.00%	4.00%

The assumed hospital and drug cost increase was 10.0% per year for 2011, 2012, and 2013 grading down 0.5% per year to 5.0% in 2023. Dental costs are assumed to increase by 4.5% per year.

Summary of benefit costs and plan contributions are as follows:

(in thousands of Canadian dollars)	2012 Pension Benefits	2011 Pension Benefits	2012 Other Benefits	2011 Other Benefits
	\$	\$	\$	\$
Current service cost (employer)	6,279	7,536	1,923	1,784
Interest cost	25,317	24,502	4,410	4,147
Expected return on plan assets	(20,402)	(18,808)	—	—
Amortization of net actuarial loss	791	1,086	149	194
Benefit cost	11,985	14,316	6,482	6,125

(in thousands of Canadian dollars)	2012 Pension Benefits	2011 Pension Benefits	2012 Other Benefits	2011 Other Benefits
	\$	\$	\$	\$
Employer contribution/other benefits payments	25,313	27,254	1,768	1,806
Plan participants' contributions	3,525	3,139	—	—
Benefits paid	18,300	17,214	1,768	1,806

The most recent actuarial valuation of the registered pension plan for funding purposes was at January 1, 2011, and the date of the next required valuation is January 1, 2014.

Principal assumptions used to calculate benefit costs are determined at the beginning of the period and are as follows:

	2012 Pension Benefits	2011 Pension Benefits	2012 Other Benefits	2011 Other Benefits
Discount rate at the beginning of the period	6.50%	6.50%	6.50%	6.50%
Expected return on plan assets	6.50%	6.50%	—	—
Rate of compensation increase	4.00%	4.00%	4.00%	4.00%
Rate of indexing	2.50%	2.50%	2.50%	2.50%

8. TANGIBLE CAPITAL ASSETS

Net tangible capital assets consist of the following:

Tangible Capital Assets

(in thousands of Canadian dollars)	As at December 31, 2011	Additions	Disposals	As at December 31, 2012
	\$	\$	\$	\$
Facilities	49,823	492	—	50,315
Market systems and applications	239,726	1,849	(608)	240,967
Infrastructure and other assets	49,325	3,489	—	52,814
Meter data management/repository	25,043	6,172	—	31,215
Total Cost	363,917	12,002	(608)	375,311

Accumulated Amortization

(in thousands of Canadian dollars)	As at December 31, 2011	Amortization Expense	Disposals	As at December 31, 2012
	\$	\$	\$	\$
Facilities	(16,024)	(1,255)	—	(17,279)
Market systems and applications	(205,453)	(9,729)	608	(214,574)
Infrastructure and other assets	(45,110)	(1,997)	—	(47,107)
Meter data management/repository	(9,867)	(3,558)	—	(13,425)
Total Accumulated Amortization	(276,454)	(16,539)	608	(292,385)

Net Book Value

(in thousands of Canadian dollars)	As at December 31, 2011	As at December 31, 2012
	\$	\$
Facilities	33,799	33,036
Market systems and applications	34,273	26,393
Infrastructure and other assets	4,215	5,707
Meter data management/repository	15,176	17,790
Total net book value	87,463	82,926
Assets under construction	439	4,681
Net tangible capital assets	87,902	87,607

In 2012, the impact of adjustments to management's estimates of remaining asset service lives was a decrease in amortization expense of \$381 thousand (2011 – \$nil).

Interest capitalized to assets under construction during 2012 was \$4 thousand (2011 – \$235 thousand).

9. OTHER REVENUE

In its administration of the IESO-administered markets, the IESO directs the investment of market funds in highly-rated short-term investments throughout the settlement cycle. The IESO is entitled to receive the investment interest and investment gains, net of investment losses earned on funds passing through the real-time market settlement accounts. The IESO is not entitled to the principal on real-time market investments.

The IESO recognized investment income earned in the market settlement accounts of \$1,269 thousand in 2012 (2011 – \$587 thousand).

The IESO recognizes revenue as it is accrued relating to services the IESO performs and charges on a recovery basis. Cost recovery revenue in 2012 was \$2,676 thousand (2011 – \$2,891 thousand).

10. SEGMENT DISCLOSURES

Expenses by object for 2012 comprise of the following:

(in thousands of Canadian dollars)	Wholesale market operations 2012	Customer education and market enforcement expenses 2012	Smart metering entity 2012	Total 2012
	\$	\$	\$	\$
Labour	77,075	357	2,608	80,040
Computer services, support and equipment	8,686	–	719	9,405
Contract services and consultants	7,061	312	15,303	22,676
Telecommunications	3,033	1	3	3,037
Other costs	7,036	–	3	7,039
Amortization	12,981	–	3,558	16,539
Interest expense and financing charges	855	–	1,540	2,395
Total expenses	116,727	670	23,734	141,131

Expenses by object for 2011 comprise of the following:

(in thousands of Canadian dollars)	Wholesale market operations 2011	Customer education and market enforcement expenses 2011	Smart metering entity 2011	Total 2011
	\$	\$	\$	\$
Labour	78,060	171	2,327	80,558
Computer services, support and equipment	7,857	–	65	7,922
Contract services and consultants	6,651	45	10,913	17,609
Telecommunications	2,775	1	11	2,787
Other costs	7,281	2	3	7,286
Amortization	12,898	–	2,529	15,427
Interest expense and financing charges	768	–	1,063	1,831
Total expenses	116,290	219	16,911	133,420

11. CAPITAL DISCLOSURES

The IESO's primary objectives are to maintain and enhance the reliability of Ontario's power system, administer the wholesale electricity market, and serve the needs of market participants and stakeholders. In order to fulfill its mandate, the IESO receives fees from market participants (Note 1). The IESO has limited ability to accumulate a surplus from these fees.

The IESO submitted its proposed 2012-2014 Business Plan to the Minister for approval and as of February 15, 2013, the Minister has not granted or denied his approval. Subsequently, the IESO submitted an application for an interim fee for 2012 to the OEB and on December 20, 2011, the OEB approved the requested interim usage fee of \$0.822 per megawatt hour.

The IESO submitted its proposed 2013 Business Plan to the Minister for approval, and as of February 15, 2013, the Minister has not granted or denied his approval. In November 2012, the IESO sought and received clarification from the OEB that the interim fee remains in effect pending the OEB review and approval of a new fee for 2013.

The IESO is also the SME and expects to fund its SME operating costs and capital investment in the meter data management/repository through fees from users of smart meters in Ontario. To date, this investment and spending has been funded through debt. On March 23, 2012, the IESO made an application to the OEB for their approval of a smart metering charge. As of February 15, 2013, the application was still before the OEB.

12. RELATED PARTY TRANSACTIONS

The Province of Ontario is a related party as it is the controlling entity of the IESO. OEFC, OPA, OEB, Hydro One and Ontario Power Generation Inc. (OPG) are related parties of the IESO, through the common control of the Province of Ontario. Transactions between these parties and the IESO were as follows:

The IESO holds a note payable and an unsecured credit facility agreement with the OEFC (Note 6). Interest payments made by the IESO in 2012 for the note payable was \$1,756 thousand (2011 – \$1,364 thousand) and for the credit facility was \$485 thousand (2011 – \$183 thousand). As of December 31, 2012 the IESO had an accrued interest payable balance with the OEFC of \$346 thousand (2011 – \$325 thousand).

The IESO performs system studies for the OPA in support of their Power System Planning requirements and provides support for the Demand Response program. In 2012, the IESO invoiced the OPA \$276 thousand (2011 – \$660 thousand) for services associated with these programs. In 2012, the OPA has provided a secondment resource for market enforcement activities and the IESO incurred costs of \$13 thousand (2011 – \$nil) for these services. As of December 31, 2012 the IESO had a net payable balance with the OPA due to invoice adjustments of \$58 thousand (2011 – net receivable balance of \$70 thousand).

Under the *Ontario Energy Board Act*, 1998, the IESO incurs registration and licence fees. The total of the transactions with the OEB were \$514 thousand in 2012 (2011 – \$515 thousand).

The IESO performed connection assessment and approvals and technical feasibility studies for Hydro One in 2012. In 2012, the IESO invoiced Hydro One \$696 thousand (2011 – \$127 thousand). The IESO procures short circuit studies as part of connection assessments and approvals and meter services on IESO owned interconnected revenue meters from Hydro One. In 2012, the IESO incurred costs of \$130 thousand (2011 – \$134 thousand) for these services. As of December 31, 2012 the IESO had a net receivable balance with Hydro One of \$279 thousand (2011 – net payable balance of \$42 thousand).

In 2012, the IESO performed connection assessment and approvals for OPG; administered telecommunication services to market participants to connect to the real time market systems and performed technical feasibility studies. In 2012, OPG was invoiced \$144 thousand (2011 – \$64 thousand). As of December 31, 2012 the IESO had a net receivable balance with OPG of \$6 thousand (2011 – \$12 thousand).

13. FINANCIAL RISK MANAGEMENT

The IESO is exposed to financial risks in the normal course of its business operations, including market risks resulting from volatilities in equity, debt, and foreign currency exchange markets, as well as credit risk and liquidity risk. The nature of the financial risks and the IESO's strategy for managing these risks has not changed significantly from the prior year.

a) Market Risk

Market risk refers to the risk that the fair value or future cash flows of a financial instrument will fluctuate to cause changes in market prices. The IESO is exposed to three types of market risk: currency risk, interest rate risk and equity risk. The IESO monitors its exposure to market risk fluctuations and may use financial instruments to manage these risks as it considers appropriate. The IESO does not use derivative instruments for trading or speculative purposes.

i) Currency Risk

The IESO conducts certain transactions in US dollars, primarily related to vendor payments, and maintains a US dollar denominated bank account. From time to time, the IESO may utilize forward purchase contracts to purchase US dollars for delivery at a specified date in the future at a fixed exchange rate. In addition, the IESO utilizes US dollar spot rate purchases in order to satisfy any current accounts. As at December 31, 2012, the IESO did not have any outstanding forward purchase contracts.

ii) Interest Rate Risk

The IESO is exposed to movements or changes in interest rates primarily through its variable rate credit facility, cash equivalents' securities, and long-term investments. Long-term investments include investments in a pooled Canadian bond fund. The potential impact to the securities' value had the prevailing interest rates changed by 25 basis points, assuming a parallel shift in the yield curve, with all other variables held constant is estimated at \$0.4 million as at December 31, 2012 (2011 – \$0.3 million).

iii) Equity Risk

The IESO is exposed to changes in equity prices through its long-term investments. Long-term investments include investments in pooled equity funds. A 30% change in the valuation of equities as at December 31, 2012 would have resulted in a change for the year (before the impact of adjustments to the approved regulatory deferral account (Note 5) of approximately \$5.0 million (2011 – \$4.3 million). The fair values of all financial instruments measured at fair value are derived from quoted prices (unadjusted) in active markets for identical assets.

b) Credit Risk

Credit risk refers to the risk that one party to a financial instrument may cause a financial loss for the other party by failing to meet its obligations under the terms of the financial instrument. The IESO is exposed directly to credit risk related to cash equivalents' securities and accounts receivable, and indirectly through its exposure to the long-term investments in a Canadian bond pooled fund. The IESO manages credit risk associated with cash equivalents' securities (which amounted to \$7.3 million as at December 31, 2012) through an approved management policy which limits investments to investment grade investments with counterparty-specific limits. The accounts receivable balance as at December 31, 2012 included no material items past due and substantially all of the balance was collected within 30 days from December 31, 2012. The long-term Canadian bond pooled fund comprised of primarily investment grade securities.

c) Liquidity Risk

Liquidity risk refers to the risk that the IESO will encounter financial difficulty in meeting obligations associated with its financial liabilities. The IESO manages liquidity risk by forecasting cash flows to identify cash flows and financing requirements. Cash flows from operations, short-term investments, long-term investments, and maintaining appropriate credit facilities help to reduce liquidity risk. The IESO's long-term investments are normally able to be redeemed within three business days however, the manager of the pooled funds has the authority to require a redemption in-kind rather than cash and has the ability to suspend redemptions if deemed necessary.

14. COMMITMENTS AND CONTINGENCIES

Operating commitments

The obligations of the IESO with respect to non-cancellable operating leases over the next five years are as follows:

As at December 31 (thousands of Canadian dollars)

	\$
2013	1,930
2014	1,853
2015	1,784
2016	1,766
2017	1,804

Contingencies

The IESO is subject to various claims, legal actions, and investigations that arise in the normal course of business. While the final outcome of such matters cannot be predicted with certainty, management believes that the resolution of such claims, actions and investigations will not have a material impact on the IESO's financial position or results of operations.

EXECUTIVE COMPENSATION AT THE IESO

Compensation Restraints

Over the past few years IESO Management compensation has been significantly influenced by the Ontario government's call for compensation restraint within Ontario's public sector. Following the 2008/2009 recession the government has asked the public sector and its agencies, including the IESO, to constrain compensation adjustments and workforce growth as part of its economic program. In early 2010 the government took the step of enacting the *Public Sector Compensation Restraint to Protect Public Services Act (the Restraint Act)* which constrained adjustments to compensation, as well as to pension and benefit provisions, for all non-unionized employees over the period of March 24, 2010 to March 31, 2012.

On June 20, 2012 Bill 55, *Strong Action for Ontario Act*, was enacted. One of the key measures of Bill 55 is the establishment of a new wage freeze for designated executives of Broader Public Sector ("BPS") organizations including the IESO. Highlights of the new wage freeze include the following:

- The wage freeze applies to "designated executives" including the IESO's CEO, its Vice Presidents or other similar executives.
- The wage freeze incorporates a freeze to base salary at the level in effect on March 31, 2012. The new wage freeze applies indefinitely until the Province of Ontario ceases to have a budget deficit.
- Amendments to the current compensation plan for designated executives are prohibited during the restraint period. The exceptions to this wage freeze are very narrow. For example, there is no provision for increases in compensation through a pay range over this time.
- In addition there is to be a general freeze on payments, benefits and perquisites, subject to very limited exceptions.

In addition another area of significant change applies to "performance pay". More specifically:

- Affected BPS employers such as the IESO must ensure that the "performance pay envelope" for any performance cycle that falls in whole or in part during the wage restraint period does not exceed the total performance pay envelope for the last performance cycle that ended before the effective date of the freeze.
- Importantly, the new restraints on performance pay apply to all non-represented employees, and not just designated executives impacted by the wage freeze.

The IESO has responded to earlier government requests and subsequent legislative requirements. While the original compensation restraint legislation was not enacted until March 2010, the IESO met the government's earlier request for restraint by constraining variable compensation awards to executives for 2009 performance and freezing the fixed compensation of its executives at the start of 2010. Since 2011 adjustments for fixed compensation have been constrained beyond requirements within the legislation. As a result many of IESO's management staff have not had a fixed compensation adjustment since 2009.

IESO Board of Directors Initiative on Management Compensation Program Design

Even before the above government initiatives, the IESO Board of Directors (the Board), as reported in past disclosures, had undertaken an in depth review of the IESO Management compensation program design to ensure that it meets the IESO's business needs for the future. The objective of this initiative, consistent with the principles embedded in the previous Agency Review Panel Report of 2007, was to ensure that an effective compensation plan is in place to attract and retain high calibre individuals for the future, to reinforce effective performance, and to reflect future market and government expectations. The current program was put in place in 2000 when the expectations for future needs were different from today's realities.

The IESO Board originally approved the new scheme in February 2012 for implementation in January 2013, but implementation plans were delayed due to the proposed merger with the OPA. Once it was clear that the merger was no longer imminent, the Board re-confirmed implementation of the scheme for January 2013, apart from those staff at the executive level whose compensation design could not be modified under current legislation. The guiding principles for transitioning non-executive management staff from the current to the new compensation program were that it should be cost neutral to the IESO in term of total cash compensation and pension benefits, and individuals should be kept "whole" in terms of total target cash compensation and earned pension benefits at time of transition.

The following sections contain descriptions of the current programs as they apply to executives along with explanations of the impact of government restraint on the application of those affected programs.

Program Objectives

The current IESO compensation program for executives was designed to attract, retain and motivate the calibre of senior staff required to support the achievement of the IESO's statutory mandate, business objectives and corporate vision. Accordingly, the compensation philosophy and programs were built on the following objectives:

- To focus executives on meeting the IESO's business objectives
- To attract qualified and talented staff needed to carry out the IESO's mandate
- To be able to retain valued staff
- To have the flexibility to reward results and demonstrated competencies, and
- To have compensation levels which are responsible and defensible to stakeholders and customers.

The philosophy underlying these objectives is that total compensation for executives should be sufficient, but not overly sufficient, to attract and retain the skills and competencies necessary to carry out the IESO's mandate.

Program Governance

In the past, including the 2012 program, the IESO Board established the compensation objectives for the following year's program. They delegated the responsibility to thoroughly review the compensation objectives, policies and programs to the Human Resources and Governance Committee of the Board (HRGC) which made recommendations to the full Board for approval. The Board is composed of 10 independent, external Directors, appointed by the Minister of Energy, with broad experience in both industry and public sector organizations, plus the Chief Executive Officer. Their experience includes many years of dealing with Human Resource matters including the setting and implementation of compensation policies. Information on individual Board members and their backgrounds can be found on the IESO web site at http://www.ieso.ca/imoweb/governance/board_of_directors.asp.

In carrying out their mandate the Board members had access to the Management's analysis and recommendations as well as those of expert consultants in the compensation field (including experts at various times in the past from Towers Watson, Mercer and Hay). These programs have been reviewed at least annually with regard to business needs, program objectives and design, industry compensation trends, internal compensation relativities, and external market relativities.

The Board also assesses risks associated with the establishment and implementation of compensation policies and programs. Annually the Board presides over and approves the IESO's Business Plan. An important component of this process is consideration of, and the implementation of mitigating actions, associated with Enterprise Risk Management. This latter overarching process includes the assessment of all significant risks to the IESO, including risks associated with its compensation policies and programs.

In addition to the formal governance and oversight structure in place for compensation matters, the IESO, then as well as now, discloses compensation levels annually for staff earning \$100,000 or more as part of its public sector salary disclosure. For the IESO, a further level of public review and assurance is provided through a statutorily required annual review of the IESO's expenditures, revenue requirements and fees. The IESO was granted a temporary freeze of its fees in 2012. Information related to compensation matters, including Management compensation and market relativities, is subject to the Ontario Energy Board review. A range of small and large consumers, assisted by their legal and professional advisors, are represented in these public proceedings. The IESO is also responsive to various requests by the Ministry of Energy in relation to compensation enquiries such as the Agency Review Panel (ARP) in 2007 which conducted an exhaustive review of senior management compensation for the various agencies in the Ontario electricity sector.

Market Comparisons

The IESO regularly benchmarks compensation to similar positions in Canadian industry. The objective of this initiative is to determine how IESO Management compensation levels compare to those in the marketplace particularly in relation to the 50th percentile or median of the market.

As indicated last year, the IESO undertook in 2011 a major review of the compensation competitiveness of its management group. Benchmarking analysis for executive positions was not repeated in 2012 due to the restraint measures imposed by Bill 55 on the executive compensation programs including the salary ranges. The analysis in 2011 was conducted by Towers Watson. For this review two peer groups were used, a peer group of 46 organizations applied to senior management positions and 40 organizations applied to other management positions. These comparator groups were each comprised of equally weighted samples of government sector and non-government sector organizations. The samples included small and mid-sized organizations where the complexity of operations was judged to be similar to those found at the IESO. The selection of these comparators and the approach to benchmarking were based upon the principles outlined within the Agency Review Panel final report of 2007.

The following organizations were used as senior management comparators within the analysis:

Government Comparators	Non-Government Comparators
Alberta Electric System Operator	Accenture
Atomic Energy of Canada Limited	Alliance Pipeline
BC Transmission	AMEX Canada Inc
British Columbia Railway Company	ARC Resources
Canadian Deposit Insurance Corp	Bruce Power
Canadian Blood Services	Capital Power
Columbia Power	Compton Petroleum
Electrical Safety Authority	Convergys Corp
Energy Resources Conservation Board	Emera
ENMAX	Fort Chicago Energy Partners
EPCOR Utilities	FortisAlberta
Hydro Ottawa Holdings Inc.	Hunt Oil Company of Canada
Manitoba Hydro Electric	Laurentian Bank of Canada
New Brunswick System Operator	Niko Resources
Ont. Lottery and Gaming Commission	Nova Scotia Power
Ontario Power Authority	Open Text Corp
Port Metro Vancouver	Pacific Northern Gas
Powerex	Paramount Energy Trust
SaskEnergy	Pengrowth
SaskPower	Sanmina
SGL Canada	Terasen Gas
Toronto Hydro Electric Systems	The Equitable Trust
Via Rail Canada	Total E & P Canada

Job matching was independently conducted by Towers Watson and 17 IESO senior management positions were matched to the market and an additional 22 other IESO management positions were matched to their peers in the market. Market data was gathered for various components of compensation including fixed compensation and total cash compensation with emphasis on total rewards, including the sum of fixed and variable compensation, benefits and pension.

The results of the Towers Watson analysis indicated that management compensation in 2011 at the IESO was slightly below the median of the market for cash compensation (fixed plus variable compensation) paid to its management staff – in the range of 3% to 6% below the market median. For total remuneration (cash compensation plus benefits and pension) the analysis showed the IESO to be at the median of the market – in the 0% to 3% of median range.

The IESO continues to monitor annually the competitiveness of its executive compensation programs to determine when formal compensation benchmarking analysis is required.

Program Description – Roles

The current IESO program includes fixed and variable compensation, core and flex benefit plans, and pension provisions. IESO Human Resources staff participates in and reviews results from various compensation surveys and monitors economic trends such as gross domestic product trends, inflation and unemployment rates which impact on compensation, as well as monitoring internal compensation relativities. Based on this data and the IESO business priorities, Human Resources staff develops recommendations on compensation programs for all Management staff. External specialized compensation, benefit and pension consultants are utilized to ensure accurate, representative market compensation data is obtained, that current industry compensation trends are being utilized, as well as to provide insight and recommended adjustments to current programs.

For 2012 the overriding concern on the part of Management and the IESO Board related to the compensation restraint legislation, uncertain economic conditions, the potential merger with the OPA, the record provincial deficit and strong statements from the Ontario government concerning the need for continued cost control enacted through Bill 55, Strong Action for Ontario Act (Budget Measures), 2012. These factors strongly influenced the decisions of the IESO Board relating to Management compensation, particularly to restrain fixed compensation adjustments.

Program Description – Fixed Compensation

Historically broad salary ranges were put in place for each level of executive taking into account comparable market relativities. Within these bands individuals were assessed as developmental, mature or expert in their position relative to an established competency model. This model consisted of behavioural competencies, such as customer focus, drive for results, teamwork, leadership, and strategic business sense. Assessments were based upon demonstrated competency. Each individual was awarded a fixed compensation level within their band based upon their assessed competency.

Unfavourable economic conditions of major global economies continued throughout 2010, 2011 and 2012. The Government of Ontario responded to these conditions by calling for compensation restraint within the public sector. The IESO in adhering to the *Restraint Act*, the *Budget Bill 55* and the requests of the government limited 2011, 2012 and 2013 salary increases for all management staff to a few anomaly situations. For 2011 the average overall increase, based upon performance, was 0.75% and management pay ranges were frozen. For 2012 and 2013 the IESO again undertook a similar approach by limiting increases within the Management Group at the non-executive level based on performance to few staff members with overall average increases of 0.36% and 0.32% respectively.

Program Description – Variable Compensation

In order to promote a results orientation in the senior team, the variable pay plan is a significant component of the total compensation of executives. The IESO Board annually establishes a robust set of performance measures which are evaluated each year and these results carry a 70% weight within each executive's variable compensation award. The remaining 30% results from the assessment of predetermined measures/targets established for each individual executive. The IESO Board assesses the corporate performance results and the CEO's individual performance results. Under the plan, having assessed the results against target, the Board does have the ability to use some discretion in determining the final performance rating – however in the past apart from one occasion the Board has relied upon the directly assessed results to award variable compensation.

The CEO's variable compensation award for achieving the targets remained at 65% of fixed compensation for 2012 and the Vice Presidents' award levels remained at 50% of fixed compensation. The plan provides for awards above or below these target amounts depending on the performance results achieved. To address retention, 50% of the earned variable compensation is deferred and paid out over the subsequent two year period, with accrued but unpaid amounts forfeited in the event of termination with cause or voluntary resignation.

Under the provisions of the government's *Bill 55*, the design and operation of this program is to continue until the end of the restraint period.

Program Description – Group Benefits

The group benefit plan provides a core level of health & dental benefits, life insurance, disability coverage and vacation which can be adjusted by individual executives through a flexible component within the plan. The flexible element provides executives the option of adjusting their benefits to meet their individual/family needs including vacation above core amounts, levels of life insurance, health coverage and other components. Under the government's *Bill 55* this program, as existed on March 24, 2010, is also to continue in place until the end of the restraint period.

Program Description – Pension Plan

A defined benefit pension plan provides annual retirement income calculated as 2% of fixed compensation and one-half of variable compensation paid during the highest paid 36 consecutive months of service multiplied by years of service, to a maximum of thirty-five years. The pension formula is integrated with the Canada Pension Plan (CPP) to provide a level income stream before and after age 65, when the IESO pension is reduced to reflect benefits from CPP. The Plan also has early retirement provisions as well as commuted value, pension deferral and reciprocal transfer options.

The plan provides a maximum benefit of 70% of highest paid, pre-retirement earnings. As the Canadian Revenue Agency limits the amount of pension payable from a registered plan, the IESO has an unfunded supplemental employee retirement plan (SERP) to provide required pension income to meet the commitments of the Plan above that payable from the registered plan. Pension funding is provided through a combination of employer and employee contributions.

The plan also provides several options including member's life only or joint and survivor pensions, as well as pre-retirement death benefits to provide benefits to surviving spouses or beneficiaries.

Under the government's *Restraint Act* and *Bill 55* the IESO pension plan for executive staff cannot be changed beyond provisions which existed on March 24, 2010 until the end of the restraint period.

Performance Measures & Impact on Compensation

The IESO annually establishes corporate performance measures relating to its business priorities during the business planning process. These are approved, monitored and assessed by the IESO Board of Directors each year. Individual performance measures supporting one or more corporate performance measure are also developed for each executive.

As outlined above the corporate results achieved each year impact on each executive's variable pay. The following chart highlights each of the business perspectives where performance measures are established and provides a brief description of the performance objectives which were approved by the IESO Board for 2012. For each of these performance objectives specific measures and targets are defined. The specific measures and targets established for 2012 can be found on the IESO web site at <http://www.ieso.ca/imoweb/corp/corppperformance.asp>.

Business Perspective	Performance Objectives
Reliability (30% Weight)	Ontario's annual unsupplied energy is within acceptable limits (10%)
	Compliance by the IESO and market participants with applicable reliability operating standards, market rules and regulatory requirements (10%)
	The IESO-controlled grid is equipped to provide reliable electricity service going forward (10%)
Customers & Stakeholders (25% Weight)	Suppliers and consumers are increasingly exposed to prices and rates raising their awareness and ability to make appropriate decisions regarding their offers and consumption of electricity (10%)
	Customer satisfaction with the IESO's administration of the market (5%)
	IESO actions support the objectives of the Green Energy and Green Economy Act and the obligations prescribed within its regulations (10%)
Operational Effectiveness (20% Weight)	IESO successfully undertakes and completes change initiatives (5%)
	The training and development of the IESO's human resources (5%)
	Delivery on the business plan (10%)
Reputation & Relationships (25% Weight)	Reputation amongst customers and stakeholders (5%)
	Strategic engagement with government, regulators and stakeholders to advance the IESO's objectives (15%)
	IESO's technical capability enables the execution of government policy (5%)

A rating scale ranging from unsatisfactory to exceeding expectations is used to assess the results for both corporate and individual performance objectives and is used to calculate the associated variable pay amount. According to this scale corporate results and individual results may be rated from zero to 1.5 times the target variable amount (the table below outlines the ratings in detail). A payout factor is then determined and applied to the target variable pay amount for each executive.

Type of Performance	Corporate Rating	Individual Rating
exceeding expectations	1.3 – 1.5	1.2 – 1.5
meeting expectations	0.8 – 1.2	0.8 – 1.1
approaching expectations	0.3 – 0.7	0.4 – 0.7
unsatisfactory/below expectations	0.0	0.0

For 2012 the IESO Board assessed the corporate results as meeting or exceeding expectations in respect of all objectives except one which was assessed as partially meeting its specified measure. In considering this performance and the relevant circumstances the Board determined the overall corporate performance rating of 1.04. In addition to the corporate measures each executive also had an individual set of measures and targets for the year which aligned with the corporate performance objectives and IESO's business priorities and these were similarly assessed. The Board assessed the results of the CEO's performance and the CEO assessed the performance of the Vice Presidents which were also reviewed with the Board.

Other Considerations

Compensation decisions may at times be impacted by market factors – such as the recruitment of an executive with specialized skills/competencies or possessing unique talents within the industry. To this end individual incumbent arrangements are sometimes established relating to terms of employment and the possibility of future termination. The CEO has an employment agreement which outlines terms and conditions for a five and one-half year period of employment. The agreement was extended in 2012 until April 30, 2013 and the announcement was made on January 24, 2013 that the CEO will retire on April 30, 2013. Some Vice-Presidents also have provisions which provide 24 months or less of severance for termination without cause. In addition, two Vice Presidents (Mr. Campbell and Mr. Limbrick) have agreements to provide accelerated pension provisions such that, at age 65, they would each have twenty-five years of credited service.

Executive Compensation and Pension Statements

The first table below details the annual compensation for the year ended December 31, 2012 for the Executives listed. The information provided in the Summary Compensation Table differs from the information published under the *Public Sector Salary Disclosure Act* (Ontario) for the indicated period due to the timing of payment of variable pay. Disclosures under the *Public Sector Salary Disclosure Act* are limited to amounts listed on T4 taxation forms for each year (i.e. includes variable pay paid out in 2012) whereas information in the summary compensation table is based on the year for which the variable pay was earned. Variable pay is determined early in the year following the year assessed. Under the IESO plan 50% of that amount is then paid early in the year following the assessed year and 50% is deferred for payment in future years.

The second table below outlines pension plan participation and benefits for each of the Executive Officers listed. Specifically detailed are:

- total years of credited service in the pension plan
- the increase in the compensatory value of the pension (due to increased service and pensionable earnings, if applicable) during 2012
- the increase in the non-compensatory value of pension (due to a decrease in the pension discount rate) during 2012
- the estimated annual pension payable at age 65 based upon the executive's service and pensionable earnings as of December 31, 2012
- the estimated annual pension with service credits projected to age 65 using actual pensionable earnings as of December 31, 2012.

Various factors have an impact on the pension calculations displayed in Table 2. Should interest or discount rates vary significantly from one year to the next, there will be volatility in year over year pension amounts reported.

Use of Consultants

During 2012 the services of AON Hewitt were used for the development of pension data and updates on disclosure requirement. The IESO used AON Hewitt to assist with the implementation in January 2013 of the management compensation redesign for management staff at the non-executive level. In undertaking this work AON Hewitt worked closely with both management and the Board. AON Hewitt provided pension and benefit actuarial support to the IESO during 2012 as well as pension, benefit, compensation consulting services and support for the IESO collective agreement negotiations. These services were obtained through competitive bidding processes.

2012 Summary Compensation Table

Name & Position	Salary	Variable Pay ¹		Other Annual Compensation ²	Total Cash Compensation	Amounts Reported Under Public Sector Salary Disclosure
		Paid	Deferred			
Paul Murphy President & CEO	\$349,873	\$122,009	\$122,009	\$28,685	\$622,576	\$609,587
Ted Leonard VP Finance & CFO	\$199,107	\$52,664	\$52,664	\$6,534	\$310,969	\$284,110
Bruce Campbell VP Resource Integration	\$275,063	\$71,723	\$71,723	\$2,426	\$420,935	\$421,020
Bill Limbrick VP Organizational Development & CIO	\$269,706	\$70,326	\$70,326	\$376	\$410,734	\$412,329
Kim Warren VP Operations & COO	\$221,450	\$59,404	\$59,404	\$9,701	\$349,959	\$306,990

1. Reflects variable pay earned in 2012 and subsequently paid out to each executive in early 2013 (50%) with deferred amounts (50%) to be paid over the subsequent 2 years with interest.
2. Includes residual payout from IESO's flex benefit plan.

2012 Pension Benefits Table

Name & Position	Number of Years Credited Service	Increased Pension Value During 2012		Annual Benefits Payable Upon Retirement	
		Compensatory Amount During Year	Non Compensatory Amount During Year	At Year-End (2012) ¹	At Age 65 ²
		\$	\$	\$	\$
Paul Murphy President & CEO	35.000	\$138,000	\$9,000	\$312,000	\$312,000
Ted Leonard VP Finance & CFO	16.750	\$48,000	\$73,000	\$72,000	\$150,000
Bruce Campbell VP Resource Integration	26.031	\$208,000	(\$55,000)	\$179,000	\$179,000 ³
Bill Limbrick VP Organizational Development & CIO	21.419	\$92,000	\$117,000	\$143,000	\$167,000
Kim Warren VP Operations & COO	34.167	\$170,000	\$41,000	\$146,000	\$149,000

1. Payable at age 65 assuming no increase in pensionable earnings & service beyond year-end 2012.
2. Payable at age 65 assuming no increase in pensionable earnings beyond year-end 2012 and credited service continues until age 65.
3. Mr. Campbell's accrued pension payable at the valuation date is shown, as he is over age 65.

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BRUCE CAMPBELL, VICE PRESIDENT,
RESOURCE INTEGRATION, INDEPENDENT
ELECTRICITY SYSTEM OPERATOR

"With the growing amount of
variability in the system, we are
going to see different dynamics
in the market."

ART SKIDMORE, PRESIDENT AND CHIEF EXECUTIVE
OFFICER, HALTON HILLS HYDRO INC.

"Better information means
better reliability."

MICHELLE BRANIGAN, CHIEF EXECUTIVE OFFICER,
ELECTRICITY HUMAN RESOURCES CANADA

"People aren't aware of the breadth
of opportunity in our industry."

FRANÇOIS ABDELNOUR, ENERGY MANAGER,
IVACO ROLLING MILLS

"The supply situation today
is much more stable than it
was even five years ago."

PAUL MURPHY, PRESIDENT AND
CHIEF EXECUTIVE OFFICER, INDEPENDENT
ELECTRICITY SYSTEM OPERATOR

"While more uncertainty is
certain, it can be managed."



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