Glossary for 2015/16 Manitoba Hydro Cost of Service Study Review

Cost-of-Service Acronyms

Acronym	Definition	Description
1CP	Seasonal Coincident Peak	An allocation factor based on each customer class's average electricity demand during either the top coincident load hour(s) in the winter or the top coincident load hour(s) in the summer (MH uses top 50 hours). Also often referred to as Winter Coincident Peak or Summer Coincident.
2CP	Two Coincident Peaks	An allocation factor based on each customer class's average electricity demand during both the top coincident load hour(s) in the winter and the top coincident load hour(s) in the summer (MH uses top 50 hours). Also often referred to as Seasonal Coincident Peaks.
5x16	5 days by 16 hours	Refers to the on-peak and shoulder periods excluding the weekends. Some of Manitoba Hydro's export contracts specify delivery during this period.
7x16	7 days by 16 hours	Same as 5x16 but includes the two weekend days.
A&RL	Area and Roadway Lighting	Applies to general outdoor lighting equipment used to illuminate roadways as well as private or public areas on a dusk-to dawn basis throughout the Province of Manitoba. The A&RL customers are typically municipal entities such as municipal corporations, local government districts, Provincial and Federal Governments.
AC	Alternating Current	Alternating current is an electric current in which the flow of electric charge reverses direction 60 times per second (60 Hertz or 60 Hz), whereas in direct current (DC, also dc), the flow of electric charge is only in one direction. AC is the form in which electric power is delivered to businesses and residences. The usual waveform of alternating current in most electric power circuits is a sine wave.
AEF	Affordable Energy Fund	A fund established in 2006 by the Province of Manitoba (through *The Winter Heating Cost Control Act*) that required Manitoba Hydro to set aside 5.5% of its fiscal 2006/07 gross export revenues to be utilized for various energy efficiency initiatives throughout Manitoba. Approximately $19 million of the AEF's $36.8 million was earmarked for assistance to low-income electricity and natural gas customers.
CAC	Consumers' Association of Canada	An Intervener: CAC seeks to represent the interests of Manitoba Hydro's residential ratepayers. CAC has over 400 members and donors, and has had contact with approximately 14,000 consumers through education and consumer research. In recent Manitoba Hydro regulatory proceedings, CAC partnered with Winnipeg Harvest to form the Consumer Coalition to represent the interests of urban and rural residential consumers through evidence based advocacy.

Acronym	Definition	Description
CCCT	Combined-Cycle Combustion Turbine	Similar to a single-cycle combustion turbine but features additional equipment downstream of the gas turbine engine to recover the waste heat contained in the engine exhaust flows. The waste heat is generally used to generate steam, which can be used to generate additional electricity (via a steam turbine).
CDR	Churchill River Diversion	A Manitoba Hydro project, completed in 1977, that diverts a significant amount of water flow from the Churchill River into the Burntwood and Nelson River systems. Instead of building additional hydroelectric plants on the Churchill River, Manitoba Hydro deemed the CDR project more economical since many generating projects on the Burntwood and Nelson River systems were already under development. The CDR project included the construction of two control structures (Missi Falls and Notigi) as well as one diversion channel at South Bay. CRD has changed the flow and water level regimes of the affected areas and lakes, including the rising of Southern Indian Lake by approximately 3 metres. The CDR project began operation in under a 1972 interim water power licence. In 1986, however, Manitoba Hydro began to request (and subsequently obtain) annual approvals for an Augmented Flow Program from the Minister of Water Stewardship. The Augmented Flow Program involves deviating from the range of water levels and flows stipulated in the 1972 Interim licence in order to better optimize CRD operation.
COS	Cost-of-Service	A process undertaken to determine the responsibilities that each customer class has for Manitoba Hydro's total revenue requirement and to assist in determining whether domestic rates are fair and reasonable.
COSS	Cost-of-Service Study	A method of allocating a utility's costs to the various classes of customers that it serves. Its purpose is to determine a fair sharing of the utility's revenue requirement among the customer classes.
COW	City of Winnipeg	An Intervener: The City of Winnipeg is the single largest consumer of electricity in Manitoba Hydro's Area and Roadway Lighting customer class. Furthermore, the City of Winnipeg also operates several large properties which fall in the General Service category.
CP	Coincident Peak	Coincident peak is a measure of each customer class's contribution to system peak demand at the same hour of system peak.
CRP	Curtailable Rate Program	A program offered to Manitoba Hydro's industrial customers that gives credits on the customer bills in exchange for commitments to curtail their load during times of system emergencies.

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Acronym	Definition	Description
C##	N/A	The name given to a specific PCOSS allocation table related to the customer cost classification. Each table will have a unique numeric code (e.g.: C10) that is then used as reference in the PCOSS calculations made by Manitoba Hydro.
DSM	Demand-Side Management	A common utility strategy for reducing consumer demand (frequently through energy efficiency measures) for energy in order to defer the need for new generation assets. Manitoba Hydro's DSM plan, marketed under the Power Smart brand, involves various education and incentive programs aimed to reduce domestic consumption of both electrical and natural gas.
D##	N/A	The name given to a specific PCOSS allocation table related to the demand cost classification. Each table will have a unique numeric code (e.g.: D14) that is then used as reference in the PCOSS calculations made by Manitoba Hydro.
E##	N/A	The name given to a specific PCOSS allocation table related to the energy cost classification. Each table will have a unique numeric code (e.g.: E12) that is then used as reference in the PCOSS calculations made by Manitoba Hydro.
FERC	Federal Energy Regulatory Commission	An independent agency that regulates the interstate transmission and sales of natural gas, oil, and electricity in the U.S. FERC also reviews proposals to build liquefied natural gas (LNG) terminals and interstate natural gas pipelines as well as licensing hydropower projects. FERC also mandates the adherence to reliability standards in order to protect the reliability of the high voltage U.S. interstate transmission system.
G&T	Generation and Transmission	Refers to utility assets that are utilized to both generate electricity and transmit this electricity to remote load centres (i.e. populated areas)
GAC	Green Action Centre	An intervener: A non-profit organization governed by an elected community board and committed to advancing applied sustainability. Green Action Centre's mission is to promote greener and better living by sharing practical solutions and advocating for change. GAC's primary areas of work are green commuting, composting and waste, sustainable living, resource conservation, and energy and climate change policy.
GRA	General Rate Application	PUB process to review Manitoba Hydro's proposed changes to electrical or gas rates and their impacts on various customer groups.

Acronym	Definition	Description
GRTA	Generation Related Transmission Assets	Utility assets that function as "long" leads between the generator and a major transmission asset. Also known as Generation Step-Up Facilities, GRTAs are typically conductors and voltage converting assets that are only required as a result of the construction and operation of specific electricity generation projects. Specific generation projects could not exist without the identified GRTAs.
GSL	General Service Large	Customer class containing predominantly industrial customers. These customers make use of customer-owned voltage transformation assets. This customer class is divided into three sub-categories, 0-30 kV, 30-100 kV, and >100 kV, to reflect the customer's end supply voltage.
GSM	General Service Medium	Customer class containing predominantly large commercial customers. These customers use Manitoba Hydro-owned transformation assets exceeding ~200 kW.
GSS	General Service Small	Customer class containing predominantly small commercial customers with loads less than ~200 kW. This customer class is divided into two sub-categories, Demand and Non-Demand. Demand customers pay a Demand rate based on the peak demand each month, in addition to a basic monthly charge and an energy (per kWh) charge.
GT&D	Generation, Transmission, and Distribution	Refers to all utility assets that link electricity generator plants with individual electricity consumers.
GWh	Gigawatt-Hour	An amount of electrical energy equivalent to 1,000,000 kilowatt hours (kWh), or 1,000 megawatt hours (MWh).
HVDC	High-Voltage Direct Current	An electric power transmission system that uses direct current for the bulk transmission of electrical power, in contrast with the more common alternating current (AC) systems. HVDC transmission is point-to-point, as opposed to the interlaced networks that are possible with AC systems. For long-distance transmission, HVDC systems may be less expensive and suffer lower electrical losses.
IFF	Integrated Financial Forecast	Provides projections of Manitoba Hydro's financial results and position over a 20-year period (e.g.: IFF15 covers the period from 2015/16 to 2034/35). The IFF serves as the primary forecast to determine the need for rate increases that are necessary for Manitoba Hydro to maintain a reasonable financial position and progress towards attaining and maintaining its financial targets.

Acronym	Definition	Description
ISO	Independent System Operator	An independent organization, formed at the direction or recommendation of the Federal Energy Regulatory Commission (FERC) or other Canadian provincial regulator, that operates a region's electricity grid, administers the region's wholesale electricity markets, and provides reliability planning for the region's bulk electricity system. ISOs typically operates an electric-transmission system that is owned by individual utilities.
kV	Kilovolt	An amount of electromotive force equivalent to 1,000 volts (V).
kW	Kilowatt	An amount of electrical power equivalent to 1,000 watts (W).
kWh	Kilowatt-Hour	The basic unit of electric energy equal to one kilowatt of power supplied to, or taken from, an electric circuit steadily for one hour (e.g.: ten 100 W lightbulbs left on for 1 hour would use 1 kWh, or 1000 W for one hour). A typical home without electric heat uses about 10,000 kWh each year.
LWR	Lake Winnipeg Regulation	A Manitoba Hydro project, licensed in 1970 under the Manitoba *Water Power Act*, that regulates and controls the levels of water of Lake Winnipeg and its outflow to the Nelson River. Prior to completion of the project, the shallow natural outlet of Lake Winnipeg was subject to ice blockages in the winter and weed blockages in the summer. The Lake Winnipeg Regulation project included the construction of 3 new diversion channels, the Jenpeg Generating Station and associated Control Structure, as well as the Kiskitto Dam, which together help maintain the level of Lake Winnipeg between 216.7 m (711 ft) and 217.9 m (715 ft) above sea level. Relative to natural conditions, the new channels provide up to 50% more outflow capacity, thus significantly increasing the hydroelectric generating potential of the Nelson River basin.
MIPUG	Manitoba Industrial Power Users Group	An intervener: Represents the interest of the largest industrial users of electricity in Manitoba falling into the General Service Large >30kV categories. Collectively, MIPUG members purchase in excess of 5,000 GWh per year of electricity, which approximates 25% of Manitoba Hydro's domestic sales. MIPUG members have a long track record of operation and investment in Manitoba. MIPUG works on electricity supply and rate issues for its members.
MISO	Midcontinent Independent System Operator	A regional electricity transmission organization that assures unbiased regional grid management and open access to the transmission facilities. MISO serves as a link in the safe, reliable, and cost-effective delivery of electric power across all or parts of 15 U.S. states and the Canadian province of Manitoba. It is the principal market that Manitoba Hydro exports power to.

Acronym	Definition	Description
MKO	Manitoba Keewatinowi Okimakanak	An intervener: A non-profit advocacy organization representing approximately 65,000 Treaty First Nation citizens in Northern Manitoba. MKO is governed by elected Chiefs of the 30 sovereign First Nations in Northern Manitoba. MKO notes that its mission is to maintain, strengthen, enhance, lobby for and defend the interests and rights of First Nation peoples within its jurisdiction and to promote, develop and secure a standard and quality of life deemed desirable and acceptable by its member First Nations.
MMF	Manitoba Metis Federation	An intervener: The Manitoba Metis Federation is the official democratic and self-governing political representative for the Métis Nation's Manitoba Métis Community. The mandate of the MMF is to promote the social and economic interests of its members and to participate in the consideration of issues that affect its members. In Manitoba Hydro's regulatory proceedings, the MMF represents the interests of Manitoba's Métis community, which involves both residential and small business customers.
MW	Megawatt	An amount of electrical power equivalent to 1,000,000 watts (W), or 1,000 kilowatts (kW). Manitoba Hydro's peak generating capability from its hydro generating stations is approximately 5200 MW.
MWh	Megawatt-Hour	An amount of electrical energy equivalent to 1,000 kilowatt hours (kWh).
NARUC	National Association of Regulatory Utility Commissioners	A non-profit organization dedicated to representing the public service commissions of all U.S. states. Its mission is to serve in the public interest by improving the quality and effectiveness of public utility regulation. NARUC's members have an obligation to ensure the establishment and maintenance of utility services as may be required by law and to ensure that such services are provided at rates and conditions that are fair, reasonable and non-discriminatory for all consumers. NARUC publishes a Cost of Service manual that is a standard reference for cost of service studies.
NCP	Non-Coincident Peak	Non-coincident peak assesses the maximum demand of each customer class regardless of when it occurs. That is, each class has its own peak demand, but they may not occur at the same time as other classes' peak demand.
NEB	National Energy Board	Federal regulator for international electricity exports and imports. In the COSS context, there are fees paid to the NEB for permits to import or export energy.
NER	Net Export Revenue	Revenues from extraprovincial electrical energy sales, less fuel & power purchases as well as water rentals & assessments. Net export revenue is allocated to each customer classes based on the proportionate share of the total Generation, Transmission and Distribution costs allocated to each domestic class.

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Acronym	Definition	Description
NERC	North American Electric Reliability Corporation	A not-for-profit international regulatory authority whose mission is to assure the reliability of the bulk power system in North America. NERC develops and enforces Reliability Standards, annually assesses seasonal and long-term reliability, monitors the bulk power system through system awareness, and performs training for industry personnel. NERC's jurisdiction includes users, owners, and operators of the bulk power system, and is subject to oversight by both the Federal Energy Regulatory Commission and various governmental authorities in Canada.
NFAT	Needs For and Alternatives To	Extensive review of Manitoba Hydro's Preferred Development Plan by the PUB with final recommendations made to the Province of Manitoba as to which development option should proceed. Last undertaken in 2014 to review Manitoba Hydro's Keeyask, Conawapa, US Intertie, and expanded DSM project investments.
OATT	Open Access Transmission Tariff	A tariff charged to parties wishing to use transmission facilities. Under an OATT, transmission users receiving non-discriminating service comparable to that provided by Transmission Owners to themselves. The OATT is based on cost recovery, with only costs related to facilities that could be used by the transmission users included. Manitoba Hydro has an OATT that can be used, for example, by parties wishing to transmit power from MISO to Saskatchewan through Manitoba.
PCOSS	Prospective Cost of Service Study	An embedded cost of service study in that it is based on forecast financial costs for a single test year period from the Integrated Financial Forecast. PCOSS14 refers to the PCOSS with a test year of 2013/14, which is based on IFF12, the IFF approved in 2012. PCOSS14 (116/08) refers to a PCOSS produced using the methodology approved by the PUB in its Order 116/08 and based on the 2013/14 test year.
RCC	Revenue to Cost Coverage	The ratio of class revenues and costs. Generally, the objective is to obtain a RCC of 1 (or 100%) for each customer class.
SCC	Settlement Cost Centre	Part of Manitoba Hydro's SAP financial reporting and accounting system. In the context of the COSS, SCCs provide the initial functionalization of operating and maintenance costs and depreciation expense.
SCCT	Single-Cycle Combustion Turbine	A gas turbine engine powered by natural gas or diesel fuel that drives an AC generator to produce electricity. SCCTs are typically used during peak periods only because they are less efficient than CCCTs but they are lower capital cost.

Acronym	Definition	Description
SD	Standard Deviation	Standard deviation is a measure of the dispersion of a set of data from its mean. If, for example, one uses a 2.5 standard deviations confidence interval around each side of a mean, there is approximately a 0.62% (1 in 162) chance that a data point lies above the +2.5 SD range. Similarly, there would be a 0.62% chance that a data point lies below the -2.5 SD range.
SEP	Surplus Energy Program	The Surplus Energy Program is a Manitoba Hydro rate program that enables a qualifying customer to purchase surplus energy at export market prices that are determined on a weekly basis for peak, shoulder, and off-peak periods, if Manitoba Hydro has surplus energy to sell.
SPS	Special Protection Scheme	An automatic protection system designed to detect abnormal or predetermined electrical system conditions (within or outside of the utility's network), and take corrective actions to the isolate the faulted components to maintain system reliability. Such action may include changes in demand, generation, or system configuration to maintain system stability, acceptable voltage, or power flows. Manitoba Hydro's SPS is implemented through controls at Dorsey converter station.
T&D	Transmission and Distribution	Refers to utility assets that are utilized to both transmit electricity between load centres as well as distribute electricity to customers within individual load centres.
TOU	Time of Use Rates	A rate design concept that varies the cost of electricity based on when it is used. The aim is to promote energy conservation and load smoothing in order to reduce overall system peak loads, thus deferring the need for new generation assets. To implement TOU rates, customers require "smart meters" since typical electricity meters cannot record the time at which electricity is consumed.
URA	Uniform Rate Adjustment	In 2001, legislation mandated uniform rates in Manitoba (also known as "postage stamp rates"). Previously, residential customers in Northern Manitoba and in rural areas paid higher rates than those in Winnipeg. The higher Northern and rural rates were reduced to the Winnipeg rates. The loss of revenue was charged to export sales and is still reflected as a direct assignment to the Export class, reducing net export revenue by $24 million.
V	Volt	A unit of measure for the electromotive force, and representative of the difference of potential that would drive one ampere of current against one ohm of resistance. It is roughly analogous to pressure in a water pipe.
W	Watt	A unit of measure for electrical power, corresponding to the power in an electric circuit in which the potential difference is one volt and the current is one ampere.

Acronym	Definition	Description
W1, W2, W3		Three 1 km long, 230 kV transmission lines linking the Wuskwatim Generating Station to the Wuskwatim Switching Station.
ZOR	Zone Of Reasonableness	An established tolerance zone around the COSS RCC target of 100% for each class. Manitoba Hydro's Zone of Reasonableness is for RCCs to be within the range of 95 to 105 percent. A ratio outside of the ZOR is one factor to be considered in the possible differentiation of rate increases.

Cost-of-Service Terms

Term	Description
Bipole	An electrical power transmission line, within a HVDC system, having two direct-current (DC) conductors in opposite polarity. A bipolar scheme can be implemented so that the polarity of one or both poles can be changed. This allows the operation as two parallel monopoles. If one conductor fails, transmission can still continue at reduced capacity on the other pole.
Christensen Associates	Manitoba Hydro's consultant providing advice on cost of service matters.
Converter Station	A high voltage direct current (HVDC) converter station is a specialised type of substation which forms the terminal equipment for a HVDC transmission line. Converter station equipment converts alternating current to direct current, or the reverse. Manitoba Hydro currently operates, or has in construction, three northern converter stations (Henday, Radisson, and Keewatinokh) to convert to alternating current (AC) collected from nearby generating stations to direct current (DC) power for transmission. As well, Manitoba Hydro operates, or has in construction, two southern converter stations (Dorsey and Riel) to convert DC to AC for downstream customer transmission and distribution.
"Customer" Cost Classification	Utility costs that tend to vary with the number of customers. These would include asset costs such as meters and service drops, as well as billing, meter reading, and customer service costs.
Customer Service (functionalization)	Costs associated with service provided to the customer after delivery of energy.

Term	Description
"Demand" Cost Classification	Utility costs associated with consumption of electricity at peak periods and the maximum size (capacity) of facilities to serve those demands. These would generally include assets such as transmission lines and substations.
Dependable Energy	Energy that can be produced by Manitoba Hydro even during drought conditions, and is based on water levels and flows experienced in the lowest flow year on record. This includes the minimum expected generation from the hydraulic generating stations plus continuous operation of the Selkirk and Brandon thermal generating stations, plus the minimum expected wind generation from St. Leon and St. Joseph, plus contracted imports.
Dependable Sales	Export sales made from dependable energy resources. These are also referred to as firm sales.
Distribution (functionalization)	Utility assets used to distribute lower voltage electricity to individual customers. Manitoba Hydro recently functionalized all <30 kV distribution lines (with associated low voltage portions of substations), as well as low voltage transformers and metering, as distribution in its PCOSSes.
"Energy" Cost Classification	Utility costs that vary with the consumption of electricity. All of Manitoba Hydro's generating station costs are classified as "energy".
Equivalent Peaker	A cost of service methodology used to help determine the classification of generation assets. Generators provide both demand and energy, but the classification is not always clearly defined. The Equivalent Peaker method estimates the cost of an equivalent peaking generator, which is typically a single cycle gas turbine because it is the least expensive generator that can provide capacity (i.e. respond to peak demand). It then considers the cost of the alternative generator (e.g. hydroelectric, coal, etc.) and assumes the ratio of the alternative generator's cost to the equivalent peaker's cost is the same as the ratio of the energy to demand classification.
Feeder	In a power distribution system, and electric feeder is a set of electric conductors that originate at a primary distribution center and supply power to one or more secondary distribution centers, branch-circuit distribution centers, or a combination of these.
Firm Sales	Export sales made from dependable energy resources.
Generation (functionalization)	Utility assets used to generate electricity. Manitoba Hydro recently functionalized all generating facilities, northern collector circuits, and HVDC facilities as generation in its PCOSSes.
Generation Outlet Transmission	Electrical conductors, and related switching and control equipment, linking electrical generators to transmission substations or converter stations.

Term	Description
Generation Related Transmission Asset	Similar to Generation Outlet Transmission but can include more transmission assets that would not have been built without the generating station.
Interconnection	The physical linking of a utility's electrical network with equipment or facilities not belonging to that network. The term may refer to a connection between a utility's facilities and the equipment belonging to its customer, or to a connection between two (or more) utilities.
Intertie	Same as an interconnection, in the context of linking Manitoba Hydro's system with those in neighbouring provinces or states.
Keeyask	Manitoba Hydro's newest hydraulic generating station under construction on the Nelson River. It is projected to enter service in 2019/20.
Network Transmission	A system of interconnected electrical transmission lines that minimizes the probability of grid instability and failure. Network transmission also facilitates the exchange of electrical power amongst utilities.
Non-Tariffable Transmission	A sub-function in Manitoba Hydro's cost of service study that captures costs of transmission lines and substations that are not eligible to be included in the Open Access Transmission Tariff. Non-tariffable transmission includes radial taps.
Off-Peak	Off-peak refers to lower electricity prices that are generally expected when power is delivered during periods of low electricity usage. Manitoba Hydro's off-peak periods are defined as all night time hours from 11pm to 7am.
On-Peak	On-peak refers to higher electricity prices that are generally expected when power is delivered during periods of high electricity usage. Manitoba Hydro's on-peak periods are defined as Monday to Friday (excluding Statutory Holidays) 12pm-8pm (May-October), as well 7am-11am and 4pm-8pm (November-April).
Opportunity Sales	Export sales made from surplus generation, typically hydraulic generation that is available in most water flow conditions except drought conditions.
Radial Taps	Radial taps are generally groups of conductors (and related assets) feeding high voltage power, carried by the utility's transmission assets, directly to customers, typically large industrial users. Power delivered via radial taps typically does not make use of utility-owned subtransmission facilities.
Rate Design	The process of determining the rates charged to each customer class. The cost of service study is a principal input to the rate design. Rates for each customer class can have basic monthly charges, demand charges, and energy rates, or a subset of these three charges.

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Term	Description
Shoulder	Shoulder periods refers to electricity prices that are generally expected when power is delivered during periods of medium electricity usage. Manitoba Hydro's shoulder periods are defined as all hours (except On-Peak hours), every day from 7am to 11pm.
Substation	Substations are important features in the electrical generation, transmission, and distribution system, and generally transform voltage from high to low (or the reverse). A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages, or at the interconnection of two different transmission voltages. Manitoba Hydro operates multiple substations in order to serve the various voltage levels required by various customers.
Subtransmission (functionalization)	Lower voltage utility assets used to transmit electricity between load centres. Manitoba Hydro recently functionalized all 33kV and 66kV transmission lines and low voltage portions of substations as subtransmission in its PCOSSes.
Transmission (functionalization)	Utility assets used to transmit electricity between load centres. Manitoba Hydro recently functionalized all 100 kV+ transmission lines and high voltage portions of substations as transmission in its PCOSSes.
Water Rentals	Fees paid by Manitoba Hydro to the Provincial Government based on the amount of electricity produced from hydraulic generation.