

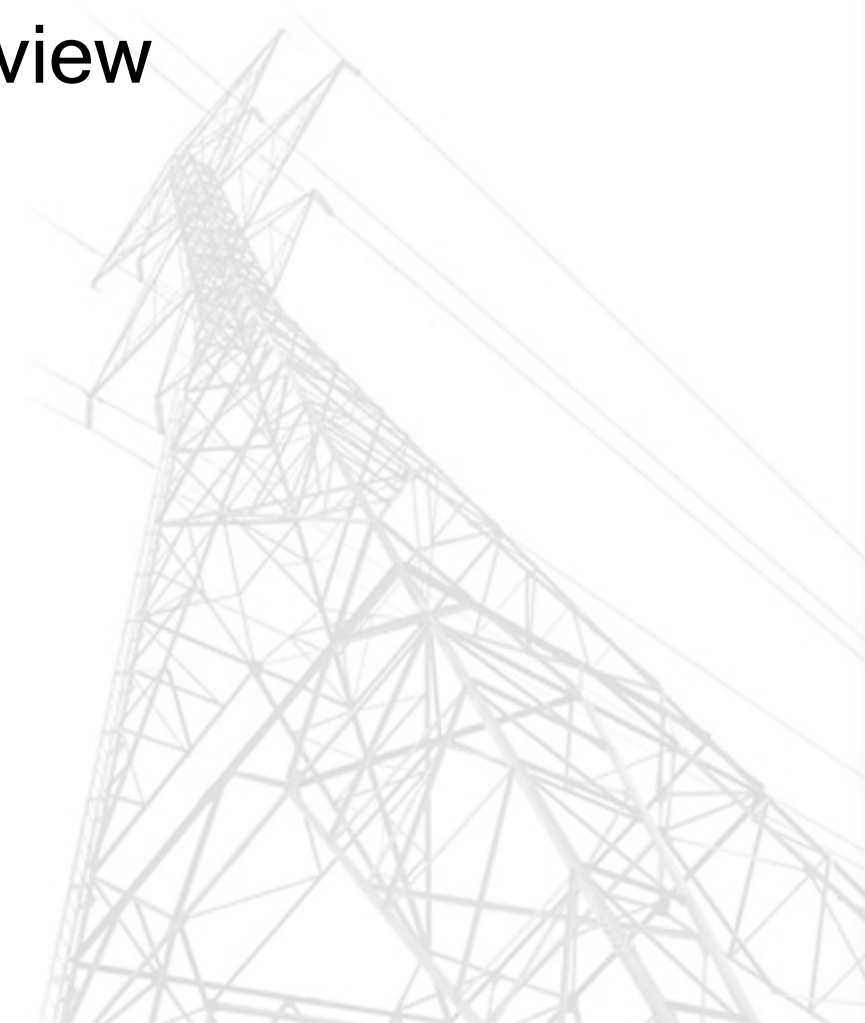
F.I.T. Connection Review

LDC Embedded Generators

EDIST - January 19 - 21, 2011

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Manager - Generation Connections





Program Status

MICROFIT PROJECT APPLICATIONS (< 10Kw)

Total OPA Applications for Hydro One	28,552
OPA Applications not yet received by Hydro One	6,046
OPA Applications received/ processed by Hydro One	22,506



Total applications

	Micro	Capacity Allocation Exempt	Capacity Allocation Required
Applications For Hydro One Distribution	28,552	2,779	1,263
Applications for Other LDCs	17,172	5,606	347



Initial FIT Issues – LDC's

- LDC FIT connections – no separate process for LDC's before FIT launch
- Application volumes – H1 expected a large number of CAE's from LDC's.
- CAE's go to OEB for decision if no capacity.
- CIA cost – \$3k per CAE (greater than 10 kW)



LDC FIT Initiatives by Hydro One to date

- Created a separate process for LDC FIT connections
- Convened an LDC Working Group for input – focused on CAE projects
- Implemented Threshold CIA's for LDC Inverter based CAE's
- Streamlined the application Individual CIA's
- Online Calculator developed for capacity monitoring

Sample – List of Station Capacity



Station Name	Bus Name	Feeder Name	Voltage (kV)	Minimum Load (MW)	Short Circuit Capacity (MVA)	Thermal Capacity (MW)	Upstream TS	Upstream TS feeder
PAISLEY DS #2	T1	F1,F2,	8.32	0.7	N/A	3.1	HANOVER TS	M4
PAISLEY DS #2	T2	F3,F4,F5	4.16	0.3	N/A	2.7	HANOVER TS	M4
PAKENHAM DS	Total	F1,F2,F3	12.47	1.1	N/A	4.0	ALMONTE TS	M25
PALERMO TS	BY	M1, M2, M3, M4, M5, M6, M7, M8	27.6	31.2	0.0	71.2		
PALMERSTON TS	BY	M1, M2, M3, M4	44	15.8	601.7	55.8		
PARK ROAD DS	T1	F1,F2,F3,F4	27.6	3.7	N/A	5.0	WILSON TS DESN 2	M16
PARK ROAD DS	T2	F1,F2,F3,F4	27.6	2.4	N/A	5.0	WILSON TS DESN 2	M16
PARK ROAD DS	Total	F1,F2,F3,F4	27.6	6.1	N/A	5.0	WILSON TS DESN 2	M16
PARKHILL DS	Total	F1,F2,F3	8.32	0.7	N/A	2.4	CENTRALIA TS	M4
PARRY SOUND TS	BY	M1, M2, M3, M4	44	14.0	903.3	34.0		
PAUDASH DS	Total	F1,F3	12.47	1.1	N/A	4.0	HAVELOCK TS	M1
PEARL LAKE DS	Total	F1,F2,F3	8.32	1.4	N/A	3.8	HANOVER TS	M4
PEFFERLAW DS	Total	F1,F2	8.32	0.8	N/A	1.7	BEAVERTON TS	M27
PELEE ISLAND DS	Total	F1,F2,F3	7.2	0.3	N/A	1.5	KINGSVILLE TS	M4
PELHAM CENTRE DS	Total	F1,F2,F3	8.32	1.4	N/A	5.0	ALLANBURG TS	M7
PEMBROKE DS	Total	F1,F2	12.47	1.2	N/A	4.1	PEMBROKE TS	M2
PEMBROKE TS	BY	M1, M2, M3	44	5.3	1176.4	25.3		
PERRAULT FALLS DS	Total	F1,F2	12.5	0.1	117.4	0.6		
PERTH DS	Total	F1,F2,F3	8.32	0.8	N/A	2.3	SMITHS FALLS TS	M21
PERTH HALTON DS	Total	F1,F2,F3	4.16	0.3	N/A	1.7	SMITHS FALLS TS	M25
PERTH NORTH DS	Total	F1,F2,F3,F4,F5	4.16	0.6	N/A	3.0	SMITHS FALLS TS	M25
PERTH SCOTCH LINE DS	Total	F1,F2,F3,F4	4.16	0.4	N/A	2.8	SMITHS FALLS TS	M25
PERTH SUNSET DS	Total	F1,F2,F3,F4	4.16	0.5	N/A	2.9	SMITHS FALLS TS	M25
PERTH WILSON DS	Total	F1,F2,F3,F4	4.16	0.4	N/A	2.8	SMITHS FALLS TS	M26
PETAWAWA DS	T1	F1,F4,F5	12.5	1.2	424.2	5.1		
PETAWAWA DS	T2	F2,F3	12.5	0.3	425.0	4.2		
PETAWAWA DS	Total	F1,F2,F3,F4,F5	12.5	1.6	71.3	5.4		
PETERS CORNERS DS	Total	F1,F2,F3	8.32	0.3	N/A	2.7	BROWN HILL TS	M2
PETHERICKS CORNRS DS	Total	F1,F2,F3	12.47	1.1	N/A	4.0	HAVELOCK TS	M4
PIC DS	Total	F1,F2	24.9	1.1	95.6	7.1		
PICTON BARKER DS	Total	F1,F2,F3,F4	4.16	0.6	N/A	3.0	PICTON TS	M6
PICTON DISRAELI DS	Total	F5,F6,F7	4.16	0.5	N/A	2.9	PICTON TS	M6
PICTON DS	Total	F1,F2,F3	8.32	1.0	N/A	3.4	PICTON TS	M6
PICTON TS	BY	M5,M6,M7,M8	44	17.2	532.4	57.2		
PICTON UPPER LAKE DS	Total	F8,F9	4.16	0.4	N/A	2.8	PICTON TS	M6
PIGEON LAKE DS	Total	F1,F2,F3	8.32	1.1	N/A	3.5	DOBBIN TS	M2



Sample – List of Applications

Project Number	Tx Station	Tx Feeder	Dx Station	Dx Feeder	Application Date	Name Plate Capacity (kW)
17,960	PALMERSTON TS	M1	MONKTON DS	F2	29-Jul-11	90
18,760	PALMERSTON TS	M3	MILVERTON 2 DS	F2	15-Sep-11	40
18,160	PALMERSTON TS	M2	ROTHSAY DS	F2	18-Aug-11	100
15,010	PALMERSTON TS	M2			07-Dec-10	500
13,640	PALMERSTON TS	M4	HARRISTON 2 DS	F2	09-Aug-10	250
13,650	PALMERSTON TS	M2	ROTHSAY DS	F1	09-Aug-10	250
13,730	PALMERSTON TS	M2	ROTHSAY DS	F3	10-Aug-10	130
MicroFIT (20)	PALMERSTON TS	M1	ATWOOD SOUTH DS			200
MicroFIT (24)	PALMERSTON TS	M2	DRAYTON DS			234
MicroFIT (41)	PALMERSTON TS	M4	HARRISTON DS #2			410
MicroFIT (17)	PALMERSTON TS	M2	KENILWORTH DS			169
MicroFIT (26)	PALMERSTON TS	M3	MILVERTON DS #2			260
MicroFIT (10)	PALMERSTON TS	M1	MONKTON DS			100
MicroFIT (34)	PALMERSTON TS	M2	ROTHSAY DS			340
MicroFIT (18)	PALMERSTON TS	M3	TRALEE DS			180
MicroFIT (18)	PALMERSTON TS	M3	WALLACE DS			180
Existing	PARRY SOUND TS	77M4			N/A	400
Existing	PARRY SOUND TS	77M4			N/A	800
MicroFIT (3)	PARRY SOUND TS	M1	CARLING DS			30
MicroFIT (2)	PARRY SOUND TS	M3	DUNCHURCH DS			20
MicroFIT (2)	PARRY SOUND TS	M2	FOOTES BAY DS			16
MicroFIT (7)	PARRY SOUND TS	M2	HORSESHOE LAKE DS			60
MicroFIT (8)	PARRY SOUND TS	M1	KILLBEAR DS			66
MicroFIT (4)	PARRY SOUND TS	M4	MCGOWAN LAKE DS			40
MicroFIT (2)	PARRY SOUND TS	M1	MCKELLAR DS			12
MicroFIT (3)	PARRY SOUND TS	M1	POINTE AU BARIL DS			23
MicroFIT (5)	PARRY SOUND TS	M1	WAUBAMIK DS			35



Online Capacity Calculator

- It is an excel based tool available on Hydro One's website.
- Proponents can enter the size and technology type of the project, select the station and feeder from a drop down menu.
- The calculator will do a thermal and short circuit capacity check and show if the project will be able to connect or not.
- In case the project can not connect, the calculator will identify which capacity limit has been exceed (e.g. Station Short Circuit limit, Station Thermal Limit, Feeder Thermal Limit etc.).
- It also does the calculation for MicroFIT, but only has information for existing MicroFIT applications within Hydro One service territory

Station & Feeder Capacity Calculator



The screenshot shows the Hydro One website interface. At the top left is the Hydro One logo. Below it are navigation tabs: Home, myHome, myBusiness, and ourCommitment. A search bar is located on the right. The main content area is titled "Station & Feeder Capacity Calculator" and includes a description of the tool, instructions for use, and a download button. A sidebar on the left contains a menu with categories like Generators, Connecting Facilities, Transmission, Distribution, and Webinars. The "Station Capacity Calculator" link is highlighted in red in the sidebar.


Station & Feeder Capacity Calculator

Hydro One has created this capacity evaluation tool to help Feed-In Tariff (including microFIT) project applicants determine whether there is sufficient capacity to connect their proposed renewable generation installation to a Hydro One-operated station or feeder closest to, or in the vicinity of, their project location.

Instructions & System Requirements

The capacity evaluation tool requires Microsoft Excel or LibreOffice (version 3.3 or higher) to be installed on either a Windows-based PC or MAC computer prior to being downloaded and used. The calculator is updated with new station/feeder capacity information every 30 days.

After 30 days from the date of release, the calculator file (.XLS) expires and the latest version must be downloaded again from this web page to get the most accurate evaluation and result. For technical help with the evaluation tool, please contact our Business Customer Centre at dxgenerationconnections@hydroone.com or toll-free at 1-877-447-4412 (Option #2).

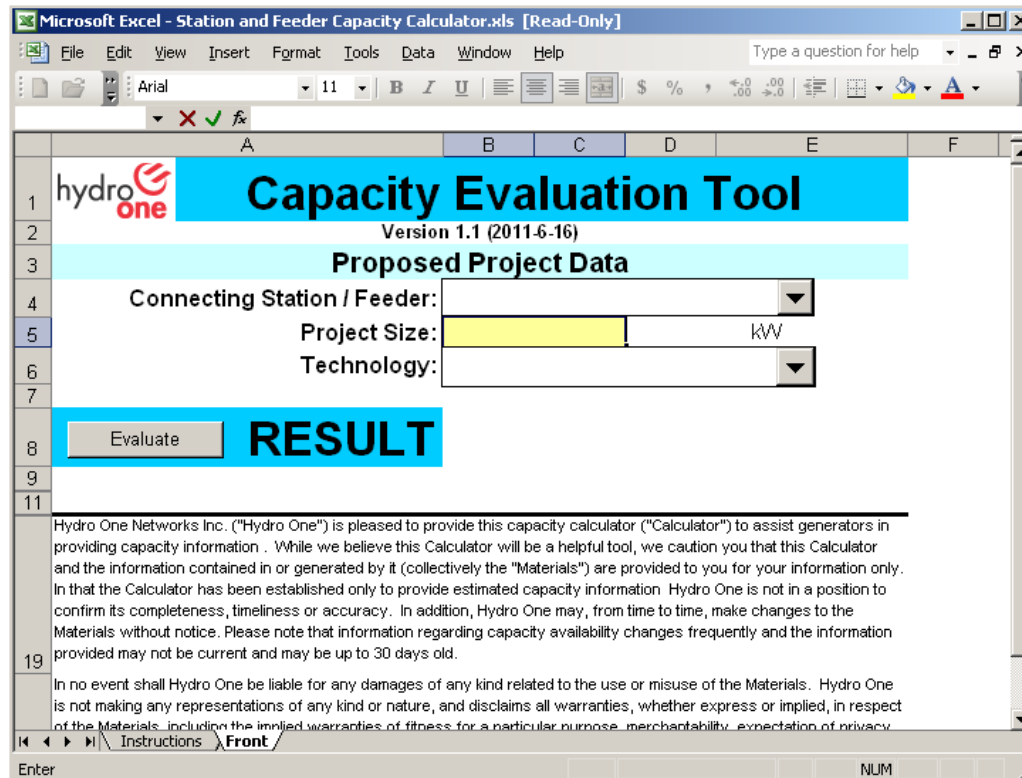
 [Download the Station & Feeder Capacity Calculator](#) **Click here to download**

- <http://www.hydroone.com/Generators/Pages/StationCapacityCalculator.aspx>



Station & Feeder Capacity Calculator – Continued

- Click to download and Open the spreadsheet
- Enable Macros





Station & Feeder Capacity Calculator Continued

- Insert all information for proposed project
- Click Evaluate
- Results appear in popup window and in tool

The screenshot shows the 'Capacity Evaluation Tool' interface. The 'Proposed Project Data' section includes:

- Connecting Station / Feeder: ABBEY DS - F1
- Project Size: 10 kW
- Technology: Solar

The 'Evaluate' button is highlighted, and the 'RESULT' is 'Passes' in a green box. Below the tool, a message states: 'In order for Hydro One to confirm capacity availability and allocate capacity to your project, you will have to apply to Hydro One for connection using Form B or Form C. To apply for a project up to 10 kW, click HERE for Form C.'

The screenshot shows the 'Capacity Evaluation Tool' interface. The 'Proposed Project Data' section includes:

- Connecting Station / Feeder: MERLIN DS - F2
- Project Size: 10 kW
- Technology: Solar

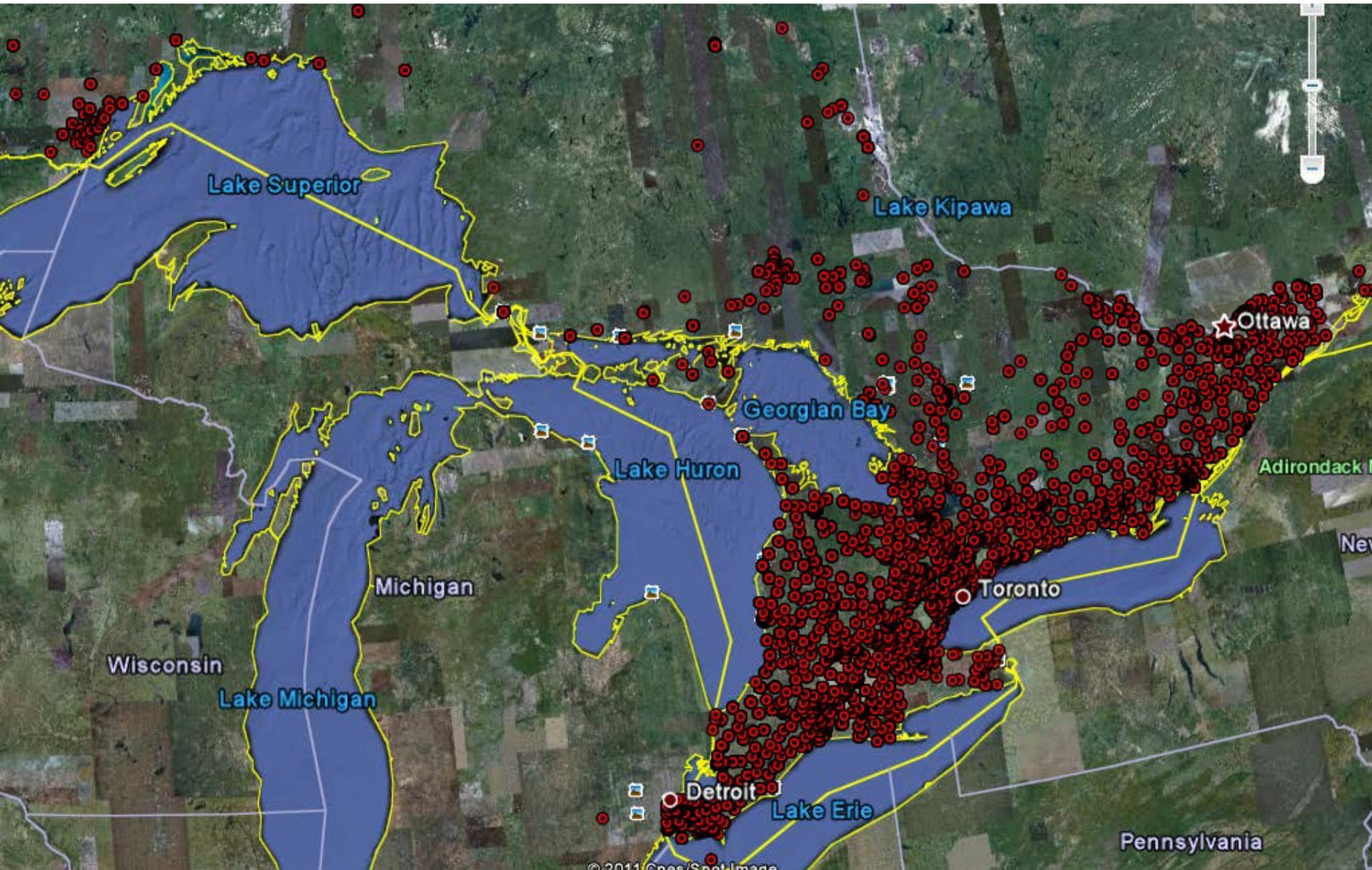
The 'Evaluate' button is highlighted, and the 'RESULT' is 'Fails' in a red box. Below the tool, a message states: 'Test 3 failed @ feeder << Generation limits (microFIT TIR section 4.3) >>'. Below this, another message states: 'In order for Hydro One to confirm capacity availability and allocate capacity to your project, you will have to apply to Hydro One for connection using Form B or Form C. To apply for a project up to 10 kW, click HERE for Form C.'



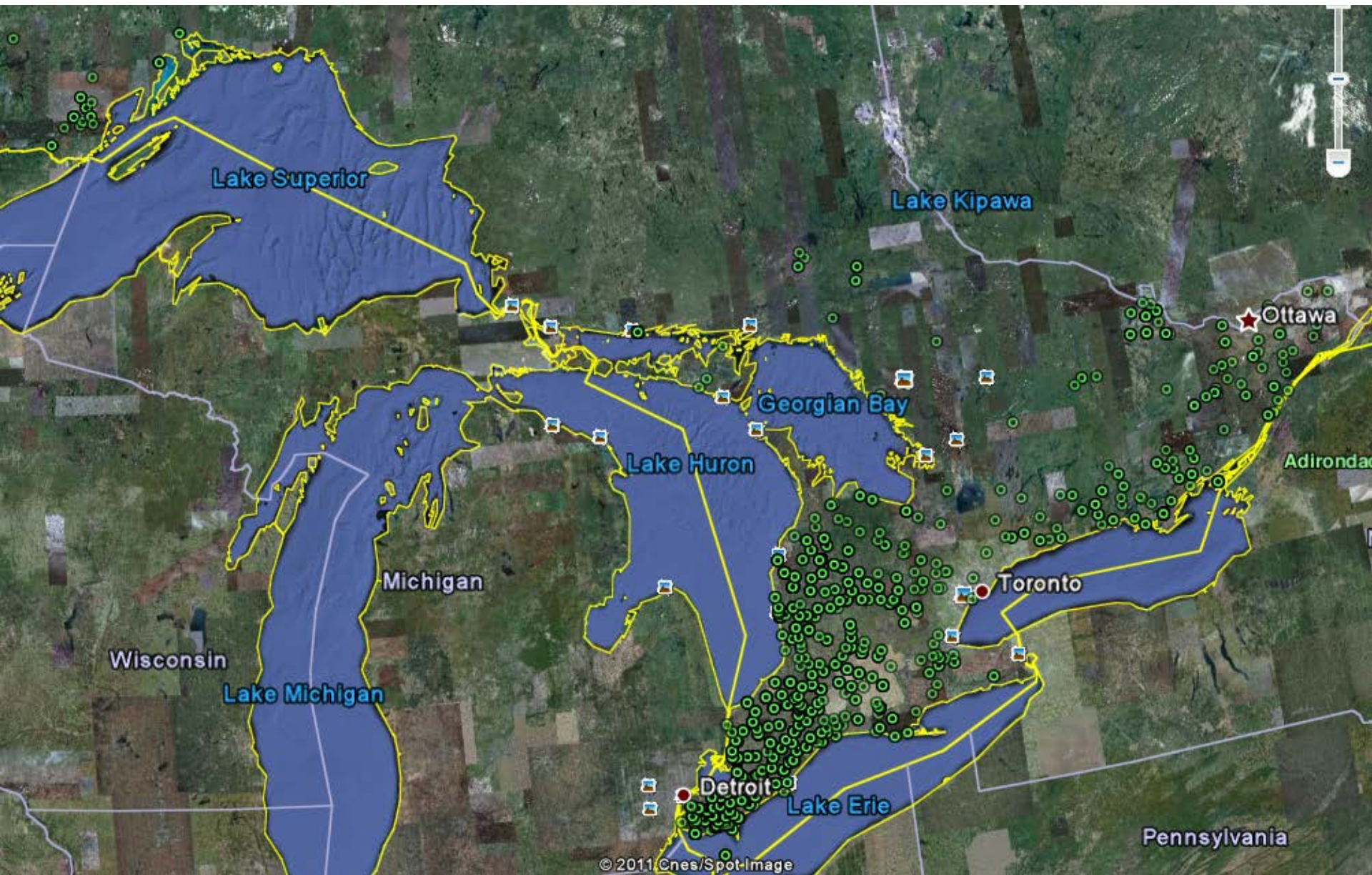
Ongoing FIT Challenges

- FIT Review
- Economic Connection Test (ECT)
- Operating issues – feeder outage impacts, DGs want to have alternate supply but capacity can only be allocated on 1 feeder and station
- Environmental Approvals for Projects

MicroFIT Projects With Capacity

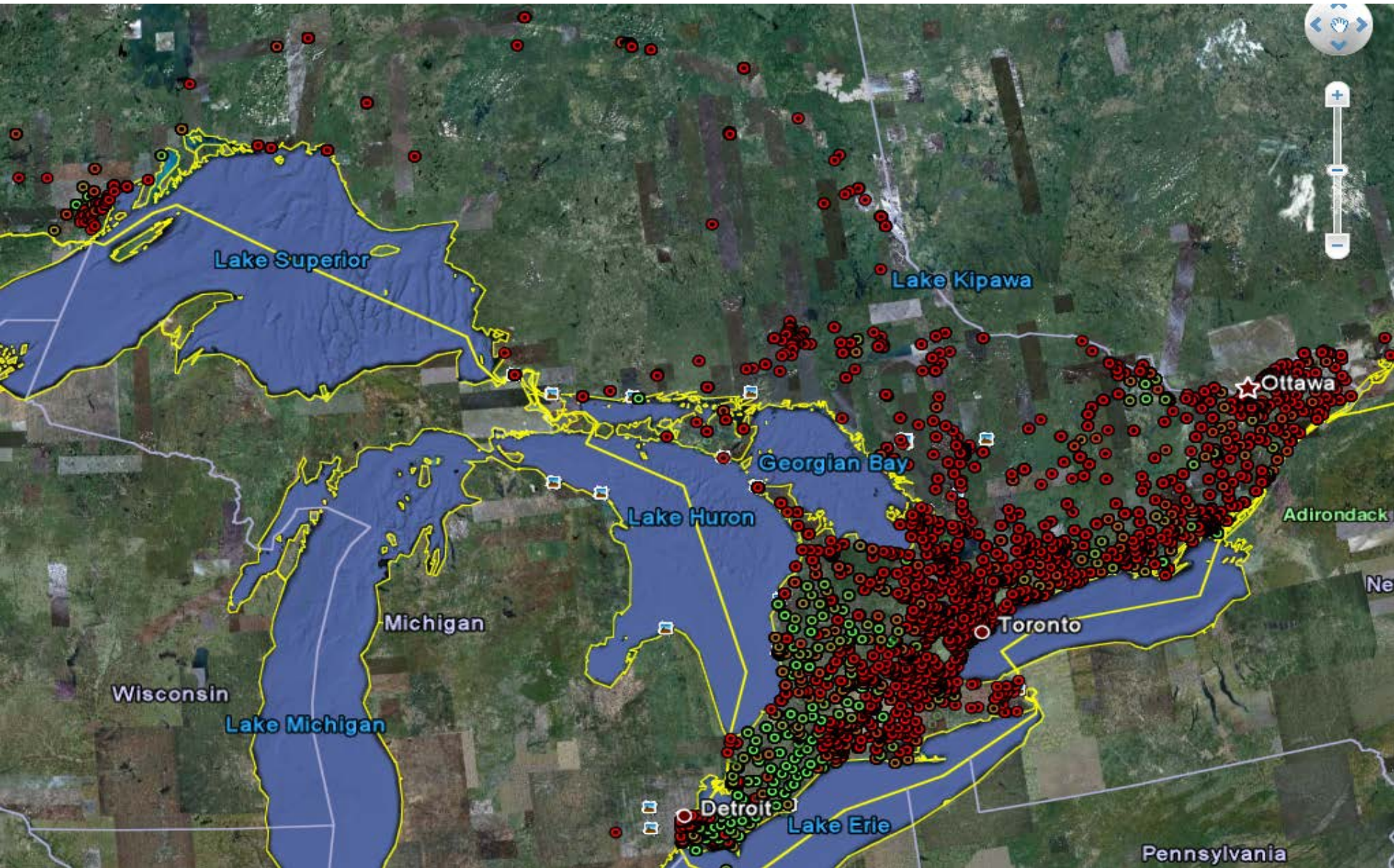


Constrained MicroFIT Projects





All MicroFIT in Hydro One





Third Party Assessment of Hydro One's Screening Criteria for MicroFIT

- Third Party Assessment completed in summer 2011
- Findings:
 - Hydro One's screening criteria for MicroFIT was appropriate based on known information
 - It recommended that changes could be made to the screening criteria only after additional study
 - Compared various anti-islanding criteria
 - Surveyed distributors connecting micro generation



MicroFIT – Test Criteria for Hydro One

- Station Capacity (List of Station Capacity)
 - Thermal
 - Short circuit
- Feeder Amp Rule (LDC-specific)
 - 400 Amp
 - 200 Amp
- Limit on Peak Feeder Load (LDC-specific)





Load Displacement

- Process and System Upgrade – OPA program
- The detailed program rules and guidelines have not been published
- Allows load displacement generators
- Load displacement generators are still subject to capacity limitations



Questions ?