

## The District of North Vancouver

# INFORMATION REPORT TO COUNCIL

March 16, 2016

**AUTHOR:** Monica Samuda Poitras, Energy Manager - Facilities

**SUBJECT:** New Strategic Energy Management Plan Improves District Efficiency

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### REASON FOR REPORT:

This report is an update on the success of the Energy Management Program, and the Strategic Energy Management Plan (SEMP). Council's continued support of the program is fundamental to achieving long term energy and greenhouse gas (GHG) reductions and associated cost savings.

### SUMMARY:

The SEMP is a long-term plan for the District to manage energy use. The strategy is built on a framework of efficiency, integrated planning, and in the short-term, focuses on DNV's four most energy intensive buildings. Implementing the updated SEMP will further reduce energy use, energy costs, and greenhouse gas (GHG) emissions, while enhancing comfort, and aligning with the Buildings Asset Management Plan.

The Energy Management Program goal is to reduce the District's GHG emissions to 20% below 2012 levels by 2017. The Energy Management Program:

- Will save over \$200,000 annually in energy costs by the end of 2016
- Has attracted over \$2M in partner and grant funding since 2010
- Has reduced carbon emissions by 193 tonnes since 2010 and will reach 873 tonnes by the end of 2018

### BACKGROUND:

The District spent \$3.35M on energy in 2014. This includes electricity, natural gas, and fleet fuel use. District buildings account for 63% of the total energy use, 54% of GHG emissions and 41% of total energy costs.

The District has been active in Energy Management since 2009 when it partnered with BC Hydro to fund the Energy Manager position and then partnered with Fortis BC in 2010 for Energy Specialist position funding. An energy reduction program was developed to support the original SEMP, with \$3.6M funding approved in 2011. The goals were \$126,000 in annual energy savings and 307 tonnes GHG emissions reductions through work on District buildings.

In 2012, the program delivery method was changed from outsourcing to staff implementing the projects in-house to improve cost-effectiveness. Staff refinements to the original proposed projects have enhanced energy and GHG emission reductions, and have added to asset value and longevity. The original program funding will be depleted in 2016 and will deliver double the energy savings than originally projected. Many more opportunities for significant energy savings have been identified in the SEMP and are planned for implementation.

The District has committed to carbon neutrality through signing the provincial Climate Action Charter, and developed Community GHG emission reduction targets as part of its OCP.

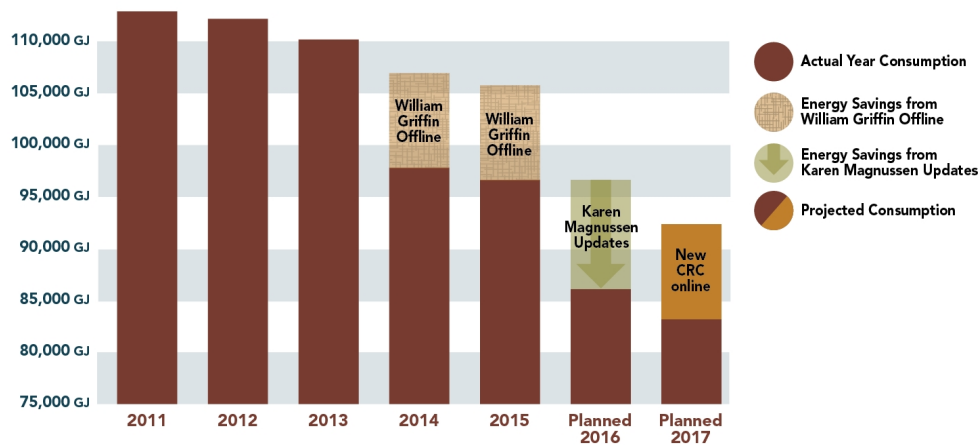
**UPDATE:**

The Energy Management Team continues to advance strategic energy management at the DNV. Building on the initial success of the energy reduction program, the updated SEMP aims to reduce energy use and GHG emissions from District Facilities 20% by 2017, compared to 2012 levels.

- ‘Efficiency First’ is a fundamental commitment of the SEMP, to focus on increasing energy efficiency before adding renewable generation such as solar, wind or biomass.
- Energy management will be integrated into asset management planning and other operational frameworks.
- To reach its target, the SEMP focuses on the District’s four highest energy-consuming buildings: District Hall, Operations Centre, Karen Magnussen CRC, and Ron Andrews CRC.

For the first time, the SEMP will be expanded in coming years to include opportunities for energy and emissions reductions in Street Lighting, Utilities and Fleet, as these areas represent 34% of energy costs; Fleet also represents 44% of District GHG emissions (2014).

The table below illustrates the District’s total annual energy consumption (in GJ) since 2011, and highlights the District’s progress in energy reduction. The large 2014 drop coincides with closure of the William Griffin Community Recreation Centre (WG CRC) facility. The rate of energy savings has increased since the development of the SEMP beginning in 2014, and the savings achieved in 2016 are projected to completely offset the energy use of the new Delbrook CRC when it comes online that year.



Now underway, the District’s Karen Magnussen Community Recreation Centre (KM) will undergo an exhaustive \$1.3M energy retrofit of its mechanical, lighting and automation systems. A significant portion of this work is being funded by a UBCM grant of \$632,000.

The KM project demonstrates the ‘Efficiency First’ priority of the SEMP, as a 50% reduction in energy and GHG emissions (\$120,000 annual energy cost savings) are projected through the renewal of aging systems.

The project is expected to attract incentives from BC Hydro and Fortis BC of approximately \$180,000. The retrofit is expected to be complete by the end of 2016. In order to achieve these large savings, the KM Energy Retrofit work improves the performance of systems throughout the facility:

- Capturing wasted heat in the Pool and Arena re-using it for water and space heating
- Converting lighting to LED throughout
- Upgrading with a modern Building Automation System with fault detection software

- Sealing the building envelope to reduce energy leaks
- Installing a low-e ceiling in the arena

The KM Energy Retrofit project will have a lasting impact on the District’s single largest energy user, and it represents one of the largest GHG emission reduction projects available within the District’s corporate operations.

Other recently completed energy projects include:

- District Hall boiler upgrade
- Building envelope sealing (21 buildings)
- Building automation evaluation
- Lighting upgrades at four Fire Halls
- Domestic hot water tank upgrades

Energy projects that are underway or beginning in 2016 include:

- Boiler upgrades at the OC and Fire Hall 1
- Energy audits at District Hall, OC, Ron Andrews CRC, Fire Hall #3, Museum & Archives, Capilano Library and Fire Hall 1
- Retrocommissioning at Lynn Valley Library, and other sites being studied
- Street Lighting – LED upgrade design & pilot installations
- Lighting retrofits – indoor & outdoor at several facilities

The outcomes of the energy audits being undertaken this year will identify further energy reduction opportunities and projects for subsequent years.

**Concurrence:**

The SEMP and resulting projects have been undertaken with the participation of:

- External stakeholders: BC Hydro, Fortis BC
- Partner agencies: NVRC, Libraries, Museum & Archives
- District Departments: Finance, Environmental Sustainability, Parks, Real Estate & Properties, Fire Services

**Financial Impacts:**

The following table lists the annual and accumulated ERP energy savings broken down in energy, GHG and dollar savings units. With completion of the KM Energy Retrofit, accumulated annual savings from energy projects will reach \$219,370/year by the end of 2017 and can continue to increase into the future.

Year	Year-by-Year			Accumulated \$ Savings
	Energy Saved (ekWh)	\$ Savings	GHG Reduction	
2011	173,854	\$ 7,450	12	
2012	267,984	\$ 11,141	10	\$ 7,450
2013	846,644	\$ 32,018	81	\$ 18,591
2014	222,275	\$ 8,474	38	\$ 50,609
2015	387,479	\$ 14,246	52	\$ 59,083
2016	3,908,472	\$ 146,041	504	\$ 73,329
2017	1,374,673	\$ 52,975	161	\$ 219,370
2018	270,985	\$ 12,027	15	\$ 272,345

Annual

### Energy Savings Summary

In addition to energy cost savings, the Energy Management Team's work has brought in over \$1.3M in BC Hydro and FortisBC funding to date, including project incentives and salary support (1.5 FTE). Additional funding received includes the \$632,000 UBCM grant for KM retrofit, and over \$400,000 for carbon tax rebates received as part of the Climate Action Revenue Incentive Program (CARIP) since 2010.

### Liability/Risk:

A Strategic Energy Management Plan ensures continual and sustained progress in energy and GHG emissions reductions. The risks of or not proceeding with energy management actions proposed in the SEMP include:

- The District is more exposed to future energy and carbon tax cost increases.
- As time passes, the lost opportunity of energy savings is compounded.
- Project implementation costs can increase if delayed to future years
- Incentive funding from utilities may be reduced, or eliminated in the future
- Energy savings are not guaranteed into the future unless energy use continues to be managed actively

### Social Policy Implications:

Investing in existing community amenities demonstrates a commitment to these neighbourhoods. Community organizations housed in DNV buildings benefit from reduced operating costs, comfort improvements and improved facility operation, allowing them to focus on their core functions.

### Environmental Impact:

Efficient energy use and GHG reductions are pillars of sustainability and a climate action plan. Through energy reductions to date, the District's corporate operations avoided emitting 193 tonnes of GHGs. With the anticipated continued support for energy projects, the forecasted GHG emissions reduction is 873 tonnes since 2011 by 2018.

Improving electrical efficiency reduces the future generation requirements created by facility operations. Conservation requires less construction and investment than energy generation.

### Conclusion:

The District's robust Energy Management program is demonstrating leadership in environmental sustainability, and is informing responsible operating and capital investments. A focus on existing operations and reducing energy requirements makes the District more resilient to climate and cost fluctuations while demonstrating financial diligence. The Energy Management program provides progress with respect to climate change mitigation and adaptation, while providing significant cost savings.

Energy management is an ongoing effort and requires continued support of council for the SEMP, the Energy Management Team, and program funding.

Respectfully submitted,

Monica Samuda Poitras, P.Eng., CEM  
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Energy Specialist

<b>REVIEWED WITH:</b>		
<input type="checkbox"/> Sustainable Community Dev. _____	<input type="checkbox"/> Clerk's Office _____	External Agencies:
<input type="checkbox"/> Development Services _____	<input type="checkbox"/> Communications _____	<input type="checkbox"/> Library Board _____
<input type="checkbox"/> Utilities _____	<input type="checkbox"/> Finance _____	<input type="checkbox"/> NS Health _____
<input type="checkbox"/> Engineering Operations _____	<input type="checkbox"/> Fire Services _____	<input type="checkbox"/> RCMP _____
<input type="checkbox"/> Parks _____	<input type="checkbox"/> ITS _____	<input type="checkbox"/> NVRC _____
<input type="checkbox"/> Environment _____	<input type="checkbox"/> Solicitor _____	<input type="checkbox"/> Museum & Arch. _____
<input type="checkbox"/> Facilities _____	<input type="checkbox"/> GIS _____	<input type="checkbox"/> Other: _____
<input type="checkbox"/> Human Resources _____	<input type="checkbox"/> Real Estate _____	