



NATURAL RESOURCES CANADA - INVENTIVE BY NATURE

Canada's Energy Efficiency Regulations – An Update Water Heating

ACEEE HWF 2019 – Nashville

March 13, 2019



Natural Resources
Canada

Ressources naturelles
Canada

Canada

Regulation History

- Amendment 13: published December 28, 2016 and came into force on June 28, 2017
 - Gas and oil storage water heater MEPS updated
 - Will apply to products manufactured on or after December 31, 2016
- Amendment 14: published October 31, 2018
 - Translate EF to UEF
 - Can test and report to either EF or UEF
 - Currently in force to meet the US market
- Amendment 15: pre-publication October 20, 2018
 - Tankless water heaters – [Bulletin](#) issued March 2017
 - Commercial water heaters – [Bulletin](#) issued July 2017



Policy Context

Regulatory Alignment with the U.S.

- **August 2014:** NRCan and U.S. DOE established goal under Regulatory Cooperation Council of aligning new and existing standards and test methods, to the extent practicable and permitted by law
- **March 2016:** Prime Minister Trudeau and President Obama pledge to better align and further improve appliance and equipment efficiency standards by 2020



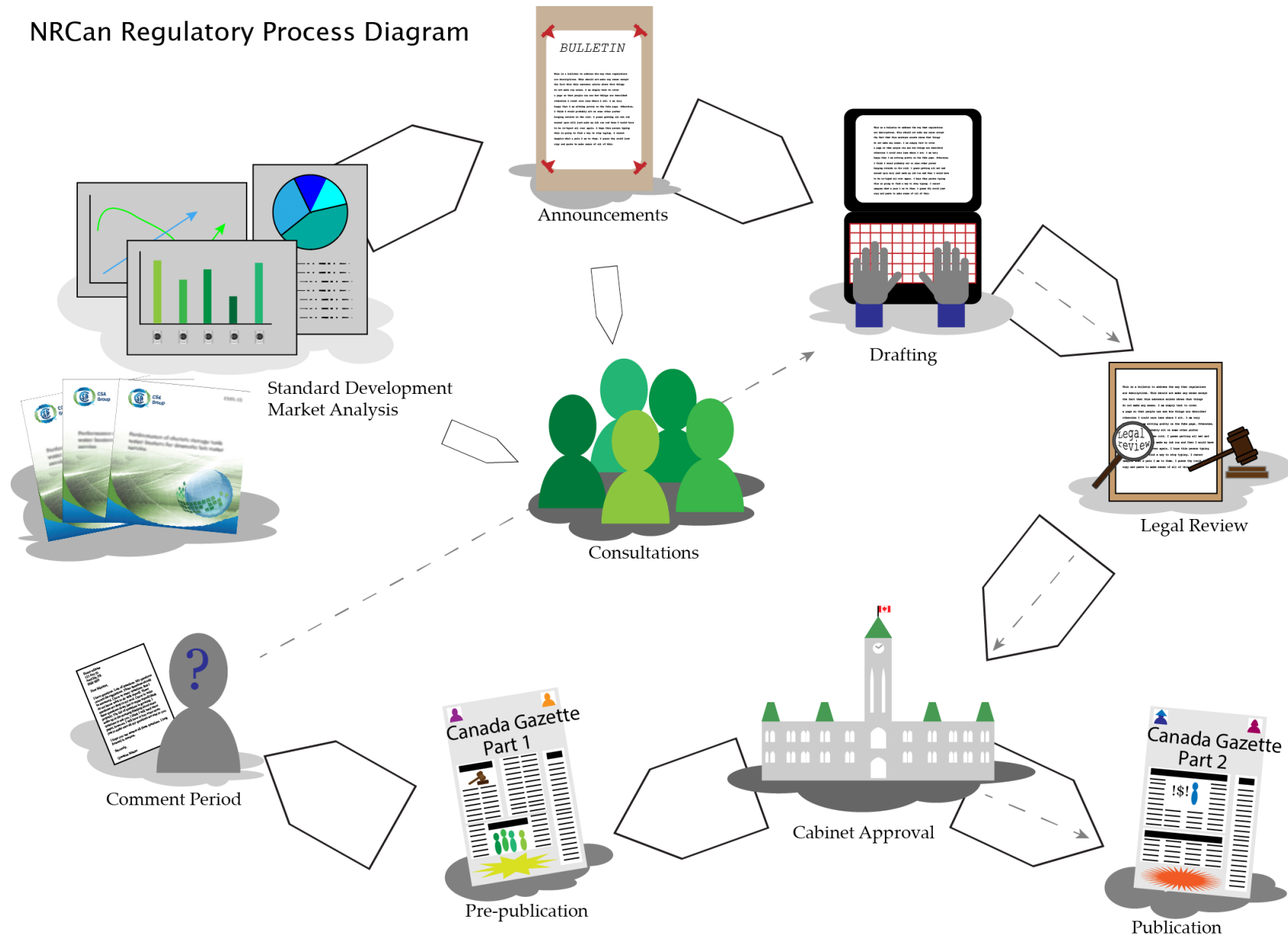
Policy Context

Pan-Canadian Framework

- Energy efficiency standards expected to play a role in pan-Canadian strategy to achieve climate change goals
- Exceed the stringency of standards in the U.S. where it makes sense
 - Water heating
 - Space heating



NRCan Regulatory Process Diagram



Electric Commercial Water Heaters

- Regulatory Landscape
 - Canada - no regulation
 - Provinces – Ontario level similar to U.S. DOE
 - US
 - NOPR: a 16% more stringent change in standby loss



Proposed Energy Efficiency Standard Electric Commercial Storage

Standby Loss,

% / hour

$$SL \leq 0.3 + 102 / V_m$$

V_m , measured volume in litres

January
1, 2020



Oil-fired Commercial Water Heaters

- Regulatory Landscape
 - Canada - no regulation
 - Provinces – no regulation
 - US
 - NOPR: no new standard increase, still at 80% thermal efficiency



Proposed Energy Efficiency Standard Oil-Fired Commercial

January
1, 2020

Product	Energy Efficiency Standard
Residential Duty Commercial	$UEF \geq 0.6740 - (0.00035 V_s)$
Storage Type	Thermal Efficiency $\geq 80\%$, Standby Loss $\leq (Q/0.234 + 16.57V_r)$

All units in metric



Gas-fired Commercial Water Heaters

- Regulatory Landscape
 - Canada - no regulation
 - Provinces – ON, similar to U.S. DOE
 - US
 - NOPR proposes: 95% thermal efficiency, a 37% difference in standby loss.
 - Similar for Residential Duty, translated to UEF.
 - Instantaneous moving to 94%



Proposed Energy Efficiency Standards – Gas-fired

January
1, 2020

Product	Scenario	Energy Efficiency Standard
Residential Duty	Existing Construction	UEF \geq 0.6719 – (0.00024 Vs)
	New Construction	UEF \geq 0.7856 - (0.00024 Vs)
Commercial Storage	Existing Construction	Et \geq 82%, SL \leq (Q/0.234 + 16.57 \sqrt Vr)
	New Construction	Et \geq 90%, SL \leq 0.63(Q/0.234 + 16.57 \sqrt Vr)
Commercial Instantaneous	All scenarios	Et \geq 94%
Household Instantaneous	All scenarios	UEFm = 0.86 UEFh = 0.87

All units in metric



Considerations – Gas-fired

January
1, 202?

Product	Scenario	Energy Efficiency Standard
Residential Duty	Existing Construction	UEF \geq 0.6719 – (0.00024 Vs)
	New Construction	UEF \geq 0.7856 - (0.00024 Vs)
Commercial Storage	Existing Construction	Et \geq 8?%, SL \leq (Q/0.234 + 16.57 \sqrt Vr)
	New Construction	Et \geq 90%, SL \leq 0.??(Q/0.234 + 16.57 \sqrt Vr)
Commercial Instantaneous	All scenarios	Et \geq 94%
Household Instantaneous	All scenarios	UEFm = 0.86 UEFh = 0.87

All units in metric



GHG Policy

- Pan-Canadian Framework on Clean Growth and Climate Change
 - Provincial and Territory cooperation
- Environment and Climate Change Canada
 - Sets the policy for federal accounting



GHG Numbers

- Social cost of carbon: \$46.84 / tonneCO₂
 - Avoided climate change damages at the global level for current and future generations
- Natural gas emissions factor: 0.04894 tonneCO₂/GJ
- Electricity marginal emissions factor: 0.094 tonneCO₂/GJ
- By 2030, \$700 Million cumulative benefit



GHG Water Heating Numbers

Product	Energy Savings	GHG Savings
Residential Duty	\$1.03	\$0.51
Commercial Storage	\$29.88	\$12.12
Commercial Instantaneous	\$2.66	\$1.03
Household Instantaneous	\$22.93	\$6.70

Millions of CDN dollars



Only questions
that I can answer,
please...



Contacts

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<http://www.nrcan.gc.ca/energy/regulations-codes-standards/6845>

