

# Electrification of Clark County, WA

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January 2020

## Background

Electrification of direct natural gas is a current topic of discussion around the efforts to decarbonize the economy. The thought being that by eliminating natural gas heat and hot water or even wood burning stoves and serving those loads with non-carbon generated electricity would reduce carbon emissions.

Current laws in Washington State specifically outlaw efforts against utilities encouraging “fuel switching”. That means Clark Public Utilities cannot encourage or incentivize retail customers to change their current utility services from natural gas to electric. Clark Public Utilities has an obligation to serve the electricity needs of Clark County and has no plans or intentions to encourage any legislative changes that would position Clark Public Utilities to encourage or entice fuel switching.

However, if discussions around state mandates to electrify Clark County continue, knowing the magnitude of such an effort is a logical. This analysis attempts to ballpark the effects.

## Technical Analysis

The 2018 Energy Information Agency (EIA) report showed that NW Natural sold a total of 49.62 million therms to their customers located in Clark County, WA during the 2018 calendar year. A simple conversion shows that if 100% of those natural gas consuming appliances and processes were fueled with electricity it would require 2.7 million megawatt hours (MWh), or 308.51 average megawatts (aMW) to meet that demand. That increase in electricity demand would represent a 57% increase in total electric sales for Clark Public Utilities.

NW Natural (WA)	Therms	MMBtu	MWh Conversion	aMW
2018 Residential Sales	4,550,746.64	4,714,584.25	1,381,725.11	157.7312
2018 Commercial Sales	23,820,447.56	2,382,044.76	698,116.92	79.69371
2018 Industrial Sales	21,248,629.36	2,124,862.94	622,743.45	71.08944
<b>2018 Total</b>	<b>49,619,823.56</b>	<b>9,221,491.94</b>	<b>2,702,585.49</b>	<b>308.5143</b>

## Qualitative Analysis

Recent building trends in Clark County, WA indicate consumers prefer natural gas fueled appliances due to their low operating costs compared to electric fueled appliances. At the same time, recent regulatory trends indicate policy makers in the West are seeking to eliminate end-

use natural gas consumption. The diverging trends leave load serving entities in a unique position with regards to future load growth.

The technical analysis showed a 57% increase in total electricity demand if natural gas was eliminated in Clark County, WA. However, the more important data point is the timing at which this increased load would hit the Clark Public Utilities distribution system. The three primary natural gas appliances in the residential sector are furnaces, water heaters and cooking stoves. Furnaces and water heaters consume a disproportionate amount of energy in the winter months, particularly during winter mornings when there is zero solar generation online and intermittent wind generation. While on average we may only see a 57% increase in demand, estimates show the winter morning peak could increase by a full 100% or more. Simply put, the electrification of the residential natural gas load would put additional pressure on the electric grid during an already strained time period.

Commercial and Industrial natural gas loads tend to be more flat than the residential sector and therefore offer a more manageable electrification opportunity. The business sectors represent 150.78 aMW of new electric load if electrified and that load would be fairly evenly spread out across the year.

To meet this potential new load Clark Public Utilities would need to significantly invest in generating resources requiring a substantial capital investment. To meet this potential new load with renewable resources would be even more costly, and would likely trigger cost cap protections in WA energy policies like the Energy Independence Act and the Clean Energy Transformation Act. As an example, Clark Public Utilities could invest in solar resources to obtain the needed energy to serve the existing natural gas load in Clark County, WA. However, such investment would require, at a minimum, the development of over 2,500 MW's of solar capacity because solar generation capacity factors in WA State are very low. 2,500 MW's of solar would require more than 6,000 acres of land to host, presenting a sizable challenge.

Furthermore, the renewable resource would likely need to be paired with a storage resource to provide the energy when the load demands it. Alternatively, Clark Public Utilities could attempt to site the solar array (or wind farm) outside our service territory but then faces transmission constraints and challenges. A new resource of this magnitude may require a new transmission build and those projects generally have a 10-year timeframe.

Assuming the new generation can be delivered to load, to facilitate such a large new load the Clark Public Utilities distribution system would require significant upgrades that would add additional rate pressure to the Clark Public Utilities system.