LONG TRAIL SUSTAINABILITY
Experts in Product Stewardship

DATASMART
Life Cycle Inventory Package

DATASMART LCI Package

What's New in DATASMART 2019?

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Details on 2019 Update

The 2019 DATASMART update includes 58 new processes and 105 updated processes[1]. This includes new Canadian electricity mixes by province and territory, as well as the high, medium, and low voltage for each region. The U.S. electricity mixes by eGRID and by state were also updated to incorporate more recently published data. Two new waste scenarios for general waste and packaging waste were created based on the most recent publications from the U.S. Environmental Protection Agency. The LTS Method was updated with three damage categories based on ReCiPe 2016, and is now called the LTS 2019 method, found in the Global Category. The 2019 update also includes more detailed documentation in the process comments. Finally, the update includes updated water flows in hydropower and nuclear energy production processes.

For more details, see below and in the full process list at *DATASMART 2019 Full Process List.xlsx*, available upon request by emailing support@ltsexperts.com.

New Canadian Electricity

The average Canadian electricity mix and the 13 Canadian provinces and territories electricity mixes (see map in Figure 1) were added, based on data from the Government of Canada, National Energy Board in 2019. High, medium and low voltage electricity processes were also created for these mixes.

- Alberta
- Ontario
- British Columbia
- Saskatchewan
- Manitoba
- Yukon
- Northwest Territories
- Nunavut
- Quebec
- New Brunswick
- Newfoundland and Labrador
- Nova Scotia
- Prince Edward Island
- Canada

[1] Processes updated directly. Does not include processes with updated documentation, processes moved to a new category or processes that have updated processes as an input (e.g. if the electricity production mix was updated, the high/medium/low voltage electricity processes are not counted as updated).

Figure 1: Map of Canadian Provinces and Territories (Source: Sporcle)

Table 1 details the electricity sources for the Canadian provinces and territories.

Table 1: 2019 Canadian Provinces and Territories Electricity Mixes (Source: Government of Canada, National Energy Board)

	Coal	Gas	Oil	Nuclear	Hydro	Biomass	Geo-thermal	Solar	Wind
Canada	9%	9%	1%	15%	60%	1%	1%	1%	4%
Alberta	45%	45%			3%	2%	2%		5%
Ontario		5%		60%	26%	1%	1%	1%	7%
British Columbia		2%	1%		90%	3%	3%		1%
Saskatchewan	47%	34%	0%		14%	1%	1%		4%
Manitoba					97%	1%	1%		2%
Yukon		2%	6%		92%				
Northwest Territories		2%	57%		39%				2%
Nunavut			100%						
Quebec					95%	1%	1%		4%
New Brunswick	21%	10%	2%	36%	20%	2%	2%		7%
Newfoundland and Labrador			5%		94%	1%	1%		

Nova Scotia	58%	14%	4%		9%	2%	2%		12%
Prince Edward Island			1%			1%	1%		98%

Updated US electricity

The following eGrid and all 50 State electricity mix processes were updated from 2016 data from the U.S. Environmental Protection Agency (EPA), published in 2018.

- Alaska Systems Coordinating Council (ASCC)
- Florida Reliability Coordinating Council (FRCC)
- Hawaiian Islands Coordinating Council (HICC)
- Midwest Reliability Organization (MRO)
- Northeast Power Coordinating Council (NPCC)
- Reliability First Corporation (RFC)
- SERC Reliability Corporation (SERC)
- Southwest Power Pool (SPP)
- Texas Regional Entity (TRE)
- Western Electricity Coordinating Council (WECC)

New Waste Scenarios

Two new waste scenarios were added based on 2015 data from the U.S. Environmental Protection Agency (EPA), published in 2018.

- Waste scenario 2015/US U
- Packaging waste scenario 2015/US U

LTS 2019 Method

The *LTS 2019 Method* was added in the Global Category, with Human Health, Ecosystems, and Resources categories based on ReCiPe 2016 Endpoint (H) version 1.03. The method also includes Cumulative Energy Demand version 1.11, Climate Change from the IPCC 2013 GWP 100a (100 year) version 1.03, and Water Use from ReCiPe 2016 Midpoint (H) version 1.03.

Table 2: Selected impact categories and corresponding methods and units of measure for the LTS 2019 Method.

Impact Category	Method	Units
Human Health	ReCiPe 2016 Endpoint (H) V1.03	DALY
Ecosystems	ReCiPe 2016 Endpoint (H) V1.03	Species.yr

Resources	ReCiPe 2016 Endpoint (H) V1.03	$
Cumulative Energy Demand	CED V1.11	MJ
Climate Change	IPCC 2013 GWP 100a V1.03	kg CO_2 eq.
Water Use	ReCiPe 2016 Midpoint (H) V1.03	m3

The ReCiPe 2016 Endpoint (and Midpoint for water use) method used is the Hierarchist version, with normalization from version 1.03 and equal weighting for all normalized impact categories.

Normalization for Cumulative Energy Demand based on Wikipedia worldwide energy demand for 2015 (IEA Key World Energy Statistics, 2017) and population for 2015 (UN Report: Total Population – Both Sexes).

Due to significant methodological differences in the update of ReCipe, the results of these three damage categories (Human Health, Ecosystems, and Resources) and ReCipe 2016 cannot and should not be compared to the LTS Method.

The previous version of the method, named *LTS Method*, used three damage categories based on ReCiPe 2008 Endpoint (H) version 1.13 method and has been moved to the superseded category. This method is no longer be supported.

Documentation

Overall documentation in each process in the DATASMART library has been updated. It is now clear in the process comments the origin of the process (ecoinvent, U.S. LCI, or another data source).

Additional documentation has been added to all dairy data, submitted to DATASMART originally by University of Arkansas. The Comprehensive Life Cycle Assessment for Cheese and Whey Products was completed in early 2012 and intended to provide those in the cheese industry with timely, science-based information to help them innovate to reduce greenhouse gas (GHG) emissions and energy demand from farm gate to consumer table. The Innovation Center for U.S. Dairy chose the Applied Sustainability Center at the University of Arkansas to conduct the LCA for cheese and whey. Product loss/waste, as well as consumer transport and storage, is included. Operational data was collected from 17 cheese-manufacturing plants representing 24 % of mozzarella production and 38 % of cheddar production in the USA. A variety of plant sizes are represented, with production ranging from 0.014 to 0.14 million tons of cheese/year. Incoming raw milk, cream, or dry milk solids were allocated to coproducts by mass of milk solids. Plant-level engineering assessments of allocation fractions were adopted for major inputs such as electricity, natural gas, and chemicals. Revenue-based allocation was applied for the remaining in-plant processes. Because cheese is produced with variable moisture content, the results are presented on a moisture-free basis unless otherwise noted.

Similarly, further documentation is available for the crop/animal food data, also submitted originally by University of Arkansas. These regions were defined in consultation with the dairy sector and are outlined on the map below and described in the comments of each process in SimaPro.

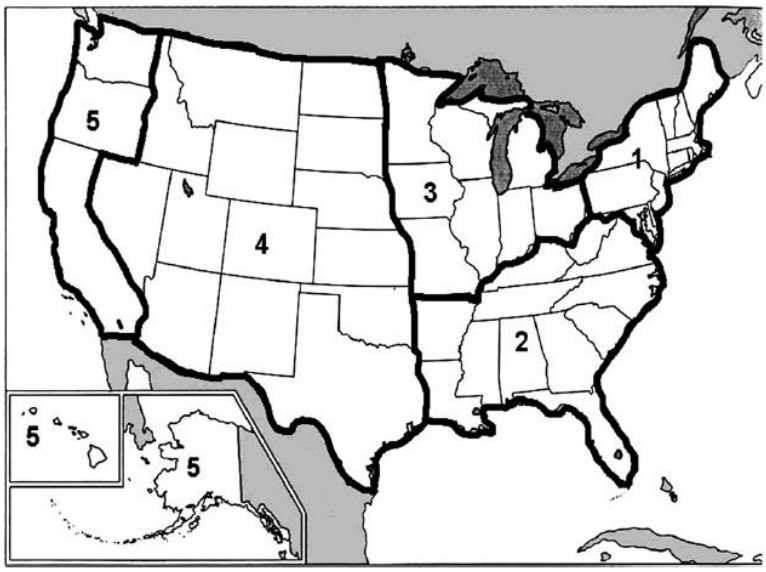

Figure 2: Source: Popp, J. S., et al., Collecting complex comprehensive farm level data through a collaborative approach: A framework developed for a life cycle assessment of fluid milk production in the US, International Dairy Journal (2012), doi:10.1016/j.idairyj.2012.04.001

Updated water flow in hydropower and nuclear energy production processes

The water flow "Water/m3" was updated to "Water, US" to reflect the geography of the emission to water for 44 hydropower and nuclear energy production processes. This reflects the change ecoinvent made between version 2.2 and 3. Details on the specific processes updated can be found in the *DATASMART 2019 Full Process List.xlsx*, available upon request by emailing support@ltsexperts.com.