



2021 NET SALES

**~\$55 billion**



EMPLOYEES

**~35,700**



MANUFACTURING SITES

**104 sites**



GLOBAL REACH

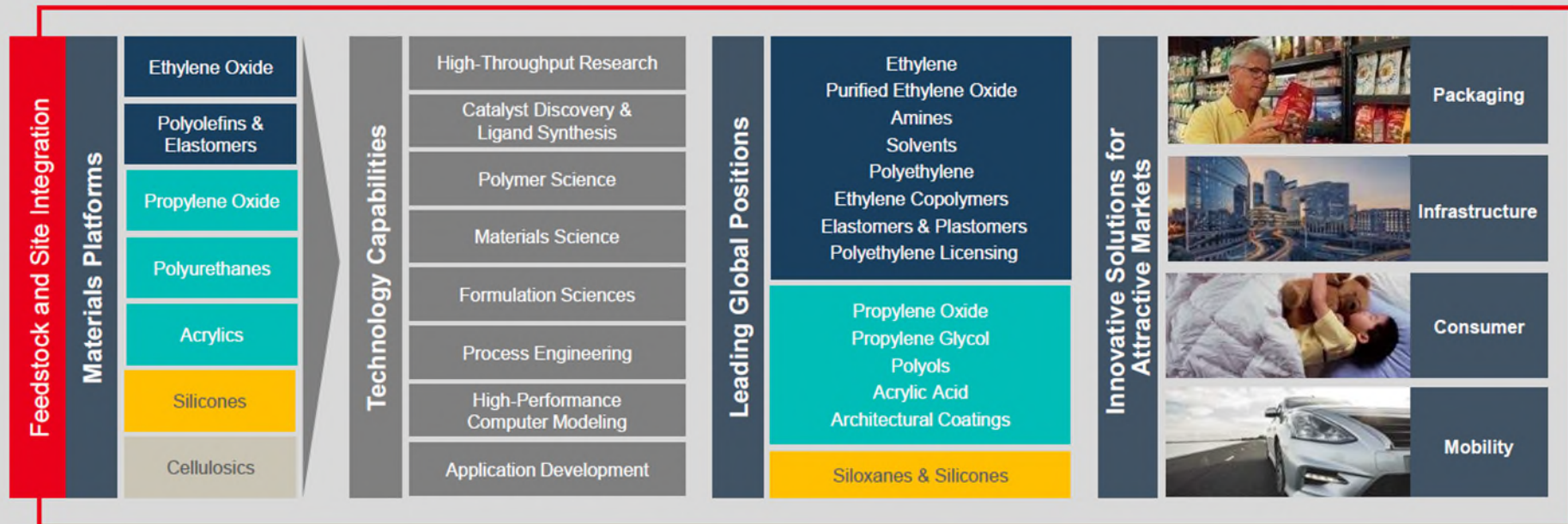
**31 countries**  
in which Dow manufactures products

GRETCHEN BAIER, P.E., PH.D.

*October 3, 2022*

# INTEGRATION ENABLES EFFICIENCY AND VALUE CAPTURE ACROSS THE CHAIN

Industry's **leading materials platforms**, enabled by **world-class capabilities**, aligned to serve **attractive growth markets**



# GLOBAL SCALE, LOCAL REACH AND COLLABORATIVE INNOVATION

106 manufacturing sites in 31 countries

12 Innovation Centers in 10 countries on 4 continents

U.S. & Canada

35 manufacturing sites in 2 countries

Latin America

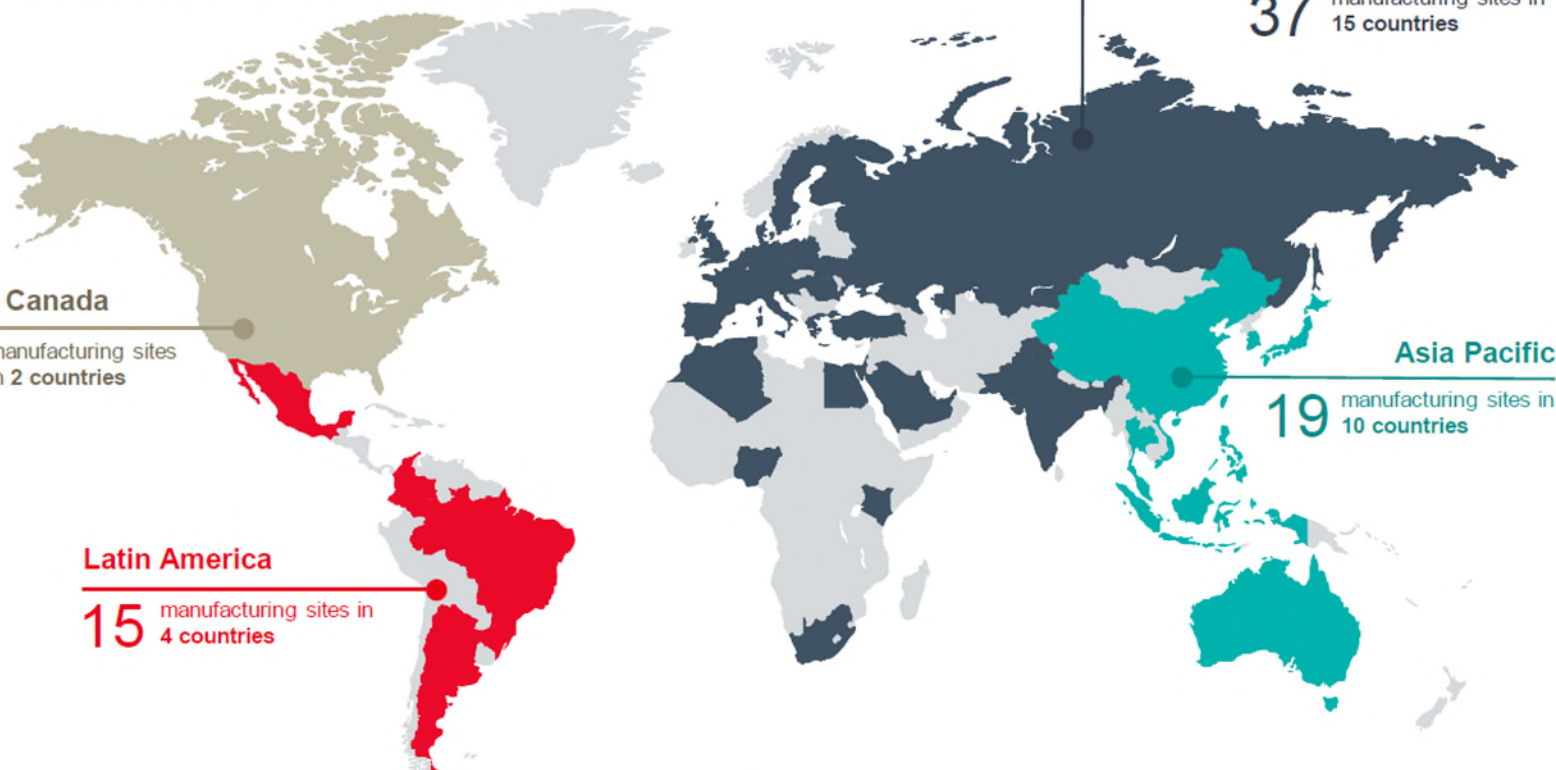
15 manufacturing sites in 4 countries

Europe, Middle East, Africa & India

37 manufacturing sites in 15 countries

Asia Pacific

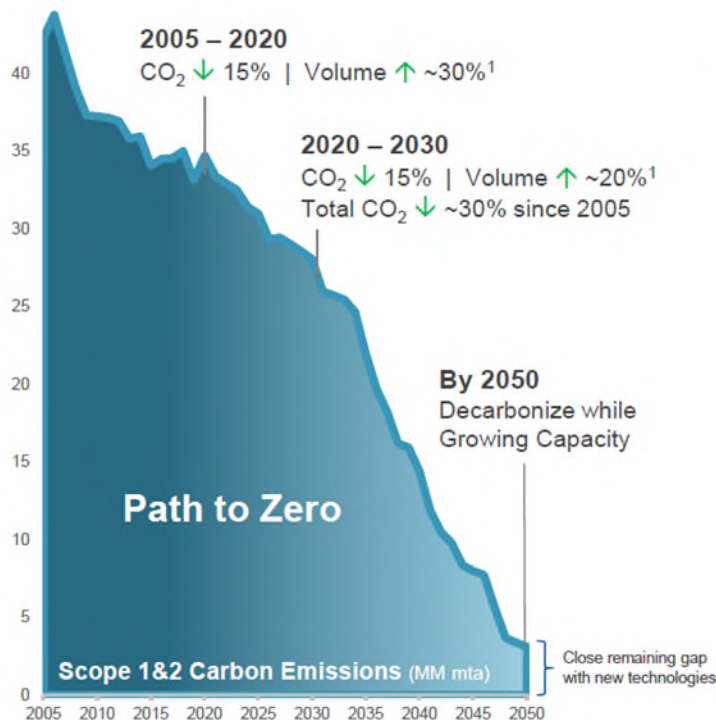
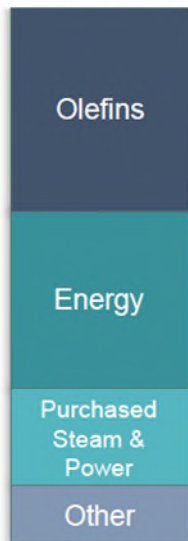
19 manufacturing sites in 10 countries



# CLEAR PATH TO ZERO-CARBON EMISSIONS WHILE DRIVING GROWTH

S1: 22.5 MMT CO<sub>2</sub>e  
S2: 4-5.7 MMT CO<sub>2</sub>e

## Dow Current Emissions



## Phased Strategy to Decarbonize and Grow

- Replace end-of-life capacity with higher-efficiency capex and opex assets while lowering emissions (e.g. TX-9)
- Capture value uplift from increasing demand for low-carbon footprint and sustainable products
- Scale carbon-efficient economical technologies, including FCDh, EDH, e-cracking
  - ✓ Capitalize on licensing opportunities to decarbonize the industry
  - ✓ Deploy new technologies to close remaining gap

## Execute while Delivering Our Financial Targets

- Maintains strong cash-generating core
- Maintain capex ≤ D&A & allocate ~\$1B/year (~1/3rd D&A) to decarbonize in a phased, site-by-site approach
- Timing based on affordability, macro, regulatory drivers and incentives to de-risk development and adoption

**Affordable and achievable path to zero-carbon emissions while supporting attractive growth**



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Green

# Dow Weighs Buying Nuclear Power in Low-Carbon Push, CEO Says

- Dow looking at two small-scale sites in the United States
- Nuclear can provide baseload power to industry Fitterling



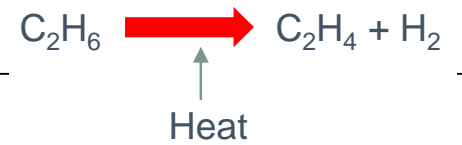
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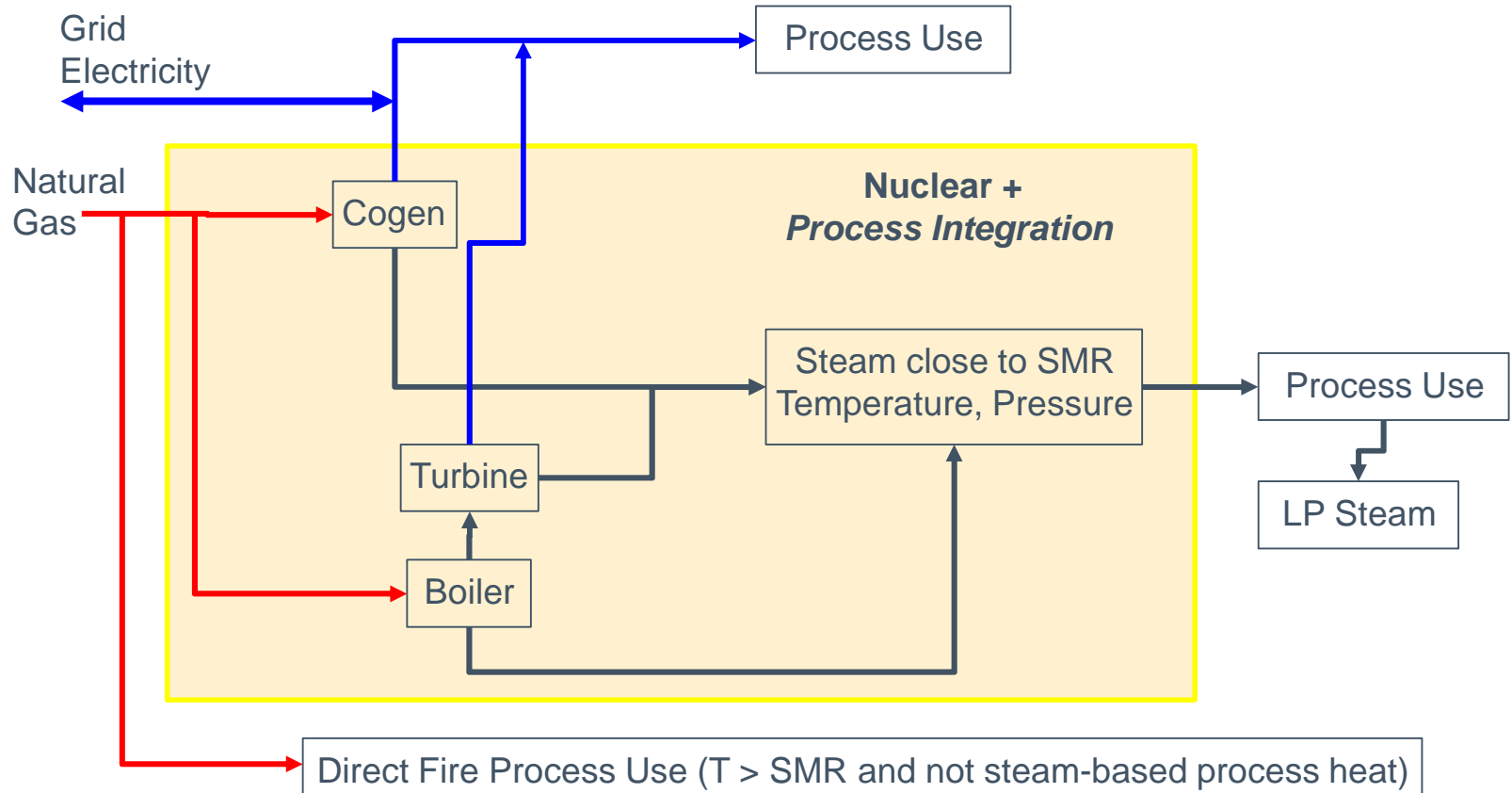
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# Dow TX-9 – WORLD'S LARGEST ETHANE CRACKER

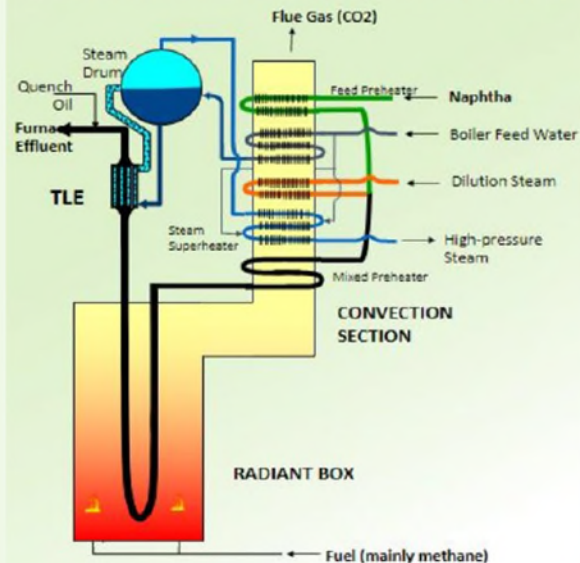


# NUCLEAR TO REPLACE DOW'S STEAM AND ELECTRICITY PLANTS



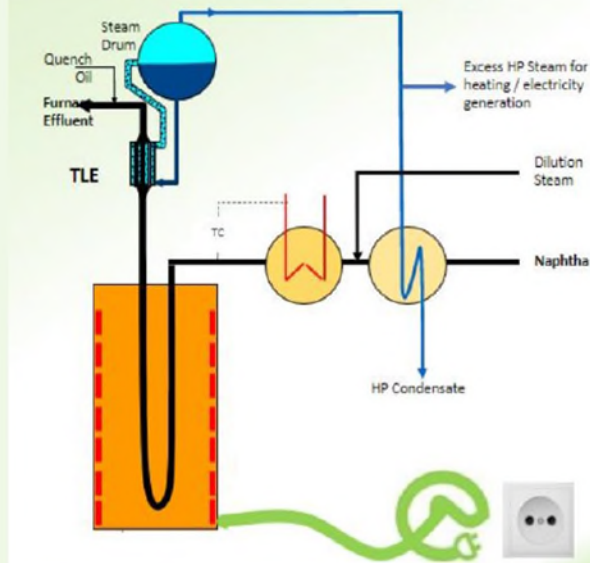
# CUTTING EDGE, LOW-CARBON EMISSIONS E-CRACKING TECHNOLOGY

## Current: Conventional Cracker



Fuel Shift  
to  
*Clean Power*

## Future: Electric Cracker



- Zero-carbon emissions with a clean-power portfolio
- Cracker retrofit possible
- Secured support from Dutch government for research scale unit



Initial  
collaboration  
with Shell



~2020

Preliminary  
investment  
decision for  
pilot-scale  
project

~2022

Potential  
startup of pilot  
plant

~2025+

Future investments  
based on technology,  
incentives





Environmental					
	Unit	2021		2020 <sup>1</sup>	2019 <sup>2</sup>
<b>Total Energy Consumption</b>	<b>Million Gigajoules (GJ)</b>	<b>574.78</b> (new method)	<b>638.68</b> (old method)	<b>630.23</b>	<b>629.07</b>
Purchased Fuels	Million GJ	317.07 <sup>4</sup>	392.71	394.42	372.50
Off-gas from Feedstock	Million GJ	262.67	250.93	241.35	260.77
Purchased Electricity	Million GJ	38.51	38.51	37.49	38.38
Purchased Steam <sup>3</sup>	Million GJ	5.14	5.14	5.23	5.96
Power and Steam Sold <sup>3</sup>	Million GJ	-48.62	-48.62	-48.25	-48.55 <sup>5</sup>
<b>Purchased Electricity from Renewable Sources – Total</b>	<b>Megawatts (MW)</b>	<b>901</b>		<b>844</b>	<b>543</b>
Wind	MW	535		375	375
Hydro	MW	168		147	147
Biomass	MW	2		0	17
Landfill Gas	MW	3		3	3
Solar	MW	193		319	0.5
<b>Purchased Renewable Power – Consumption – Total</b>	<b>Million GJ</b>	<b>10.67</b>		<b>9.46</b>	<b>8.76</b>
Wind	Million GJ	4.48		4.40	4.36
Hydro	Million GJ	5.05		4.69	4.22
Biomass	Million GJ	0.07		0	0.13
Landfill Gas	Million GJ	0.05		0.05	0.05
Solar	Million GJ	1.02		0.32	0.002
<b>Purchased Steam from Renewable Sources – Consumption – Biomass Total<sup>4</sup></b>	<b>Million GJ</b>	<b>0.52</b>		<b>0.51</b>	<b>0.45</b>

<sup>1</sup> Values listed in the analyst summary table not included in the body of this report are as reported in the 2019 Sustainability Report unless otherwise noted.

<sup>2</sup> Values listed in the analyst summary table not included in the body of this report are as reported in the 2020 Sustainability Report unless otherwise noted.

<sup>3</sup> In 2021, our purchased steam energy calculation was updated to use the work potential method. Previous reporting utilized the energy content method. Prior year values have been updated in this report to reflect the work potential method.

<sup>4</sup> 2021 data excludes purchased fuels resold and used as feedstock.

<sup>5</sup> Updated with more refined information.

## Dow Disclosures – GRI Content Index

### GRI 305: Emissions 2016

#### 305-103 Emissions management approach 2016

See [GRI 302-103 Management of Energy and Emissions](#)

#### 305-1 Direct (Scope 1) GHG emissions

GHGs are accounted for in accordance with the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard, applying the operational control approach and using emissions factors from the United Nations Intergovernmental Panel on Climate Change Sixth Assessment Report (AR6). Additionally, for sites working under the European Union Emissions Trading System (EU ETS), Dow's Scope 1 GHG emissions are externally assured. Overall, Scope 1 emissions decreased slightly in 2021 relative to 2020 supported by energy reduction projects such as flare gas reduction and other energy efficiency projects as listed in [GRI 302-4 Reduction of energy consumption](#) and [GRI 305-5 Reduction of GHG Emissions](#).

Emissions (Millions of Metric Tons CO <sub>2</sub> e)	2021	2020 <sup>1</sup>	2019 <sup>2*</sup>
Scope 1 GHG Emissions	28.29	28.49	27.20
Scope 1 GHG Emissions excluding power and steam not consumed by the company	22.55	22.93	21.79

<sup>1</sup> Updates to the 2020 Scope 1 GHG Emissions were completed in 2021 to account for facilities and emissions not previously reported and corrections in calculation methodologies. For further information refer to GHG Protocol Disclosure Report.

<sup>2</sup> Changes in methodology applied to 2021/2020 and that could not be applied 2019 due to significant burden.

Scope 1 includes Kyoto Protocol greenhouse gases [carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O) and hydrofluorocarbons (HFCs)]. Dow does not have emissions of perfluorocarbons (PFCs), sulfur hexafluoride (SF<sub>6</sub>), or nitrogen trifluoride (NF<sub>3</sub>).

Biogenic CO<sub>2</sub> emissions in metric tons of CO<sub>2</sub> equivalent were 0.5, with 2020 being the base year for the calculation.

The source of Global Warming Potential factors is from the United Nations Intergovernmental Panel on Climate Change Sixth Assessment Report: [IPCC AR6 WGI Chapter 07.pdf](#) (GWP 100, Table 7.15 beginning on Page 7-124). Note: Assuming all methane is "fossil" using GWP 29.8. Results in conservative estimate, as not yet implementing use of methane non-fossil (GWP 27.2) for some sources (e.g., landfill, wastewater treatment plant, etc.).

Dow uses the Greenhouse Gas Protocol Corporate Accounting and Reporting Standard operational control approach for emissions. Additionally, we use a hierarchy approach for calculation methods (e.g., Regulatory, Analyzer, Emission Factors, etc.).

#### 305-2 Energy indirect (Scope 2) GHG emissions

Scope 2 emissions, baselined in 2020, reflect power purchases to supply manufacturing operations around the world. These are calculated according to the Greenhouse Gas Protocol Scope 2 Guidance, including both location-based and market-based methods. The Scope 2 emissions included in the corporate total used for tracking progress against Dow's carbon emissions-reduction targets are calculated using the market-based method.

For Scope 2 emissions, Dow requests, but does not verify, the factors used when data is received from our suppliers. We assume the most recent Intergovernmental Panel on Climate Control (IPCC) assessment report (AR6) 100-year GWP values for all data if not provided. We will continue to improve our understanding of the factors used from our suppliers to represent the information as accurately as possible in the future. The data below includes four of the seven GHG emissions covered by the UNFCCC/Kyoto protocol: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and hydrofluorocarbons (HFCs). Dow does not have emissions of perfluorocarbons (PFCs), sulphur hexafluoride (SF<sub>6</sub>), or nitrogen trifluoride (NF<sub>3</sub>).

Emissions (Millions of Metric Tons CO <sub>2</sub> e)	2021	2020	2019 <sup>2</sup>
Scope 2 – market	5.68	6.07 <sup>1</sup>	6.58 <sup>1,2,3</sup>
Scope 2 – location	3.94	3.95 <sup>1</sup>	4.66 <sup>1,2</sup>

<sup>1</sup> For consistency and comparability, 2019 and 2020 values were updated using the work potential method vs. the energy content method for steam energy accounting.

<sup>2</sup> A correction was made to an emission factor used for electricity purchases.

<sup>3</sup> A correction was made to the quantity of steam purchased and consumed.



**Seek**

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