CHEMISTRY INDUSTRY ASSOCIATION OF CANADA | ASSOCIATION CANADIENNE DE L'INDUSTRIE DE LA CHIMIE

Alberta's Chemistry Sector: Adding Value to Resources

CIAC PRESENTATION TO ALBERTA WATER COUNCIL OCTOBER 29, 2015

Responsible Care®
Our commitment to sustainability.

Gestion responsable^MD
Notre engagement envers le développement durable.

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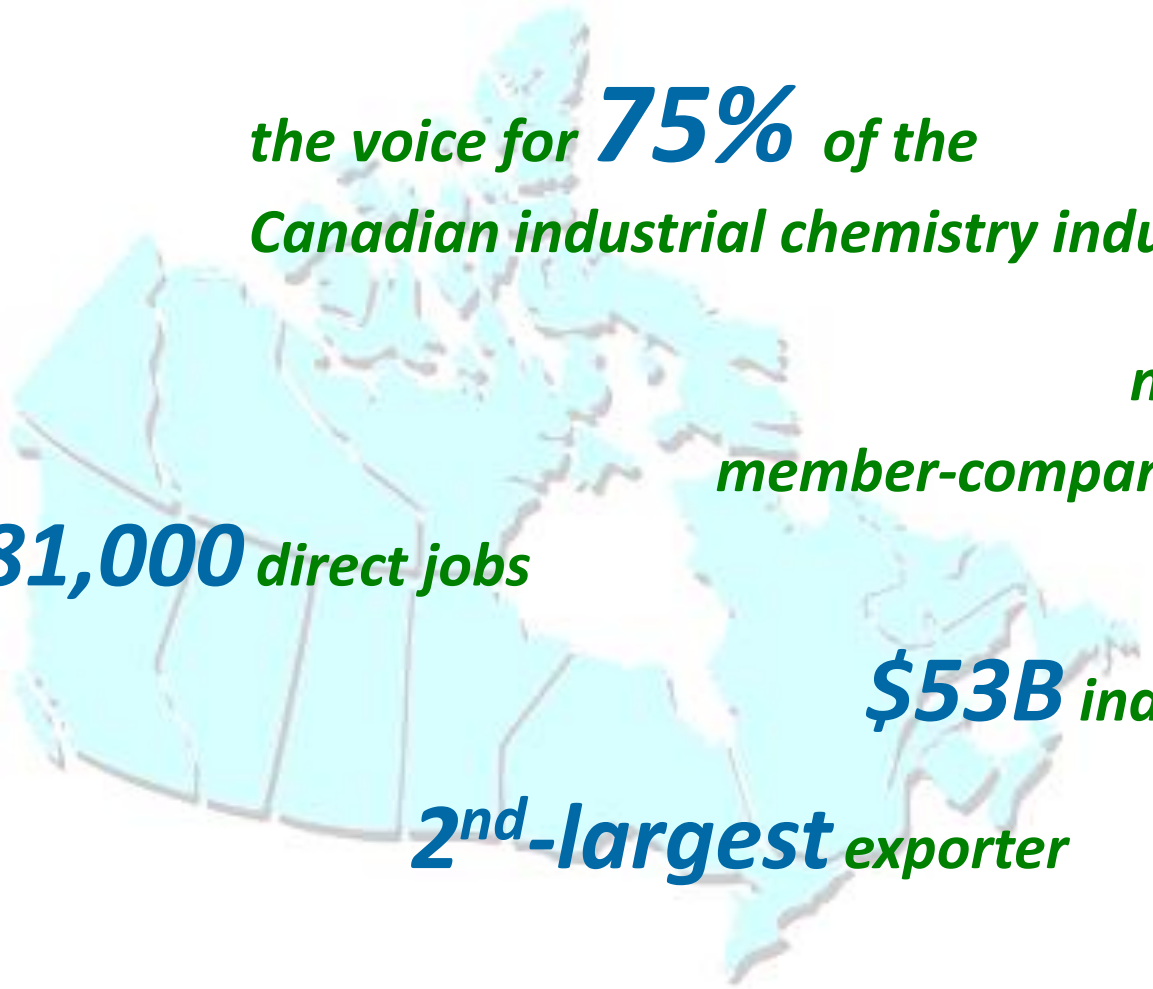

the voice for 75% of the Canadian industrial chemistry industry

more than 40 member-companies & partners

81,000 direct jobs

$53B industry

2nd-largest exporter

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Responsible Care®

is the chemistry industry's commitment to sustainability. Its ethic and principles compel companies to innovate for safer and more environmentally-friendly products and processes, and to work to eliminate harm throughout the entire life cycle and value chain of their products.

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Responsible Care® companies have reduced:

- **by 98%** – discharges to water
- **by 89%** – emissions of toxins targeted by the *Canadian Environmental Protection Act*
- **by 72%** – emissions of air pollutants, such as sulphur dioxide
- **by 70% plus** – number of injuries and illnesses in the workplace

…since 1992

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CIAC Members In Alberta

CIAC Alberta Quick Facts

#1 *manufacturing exporter in Alberta at* **$8.7B**

converts over **1/5** *of Alberta gas consumption*

$14B *in shipments*

80% *of product moved by rail*

7,850 *direct jobs*

40,000 *indirect jobs*

key markets **USA / China / Mexico**

$97K *average annual salary*

#1 *in resource-upgrading value-add manufacturing in Alberta*


NOVA & INEOS, Joffre


SHELL, Scotford


DOW
DOW CHEMICAL CANADA INC.
WESTERN CANADA DIVISION

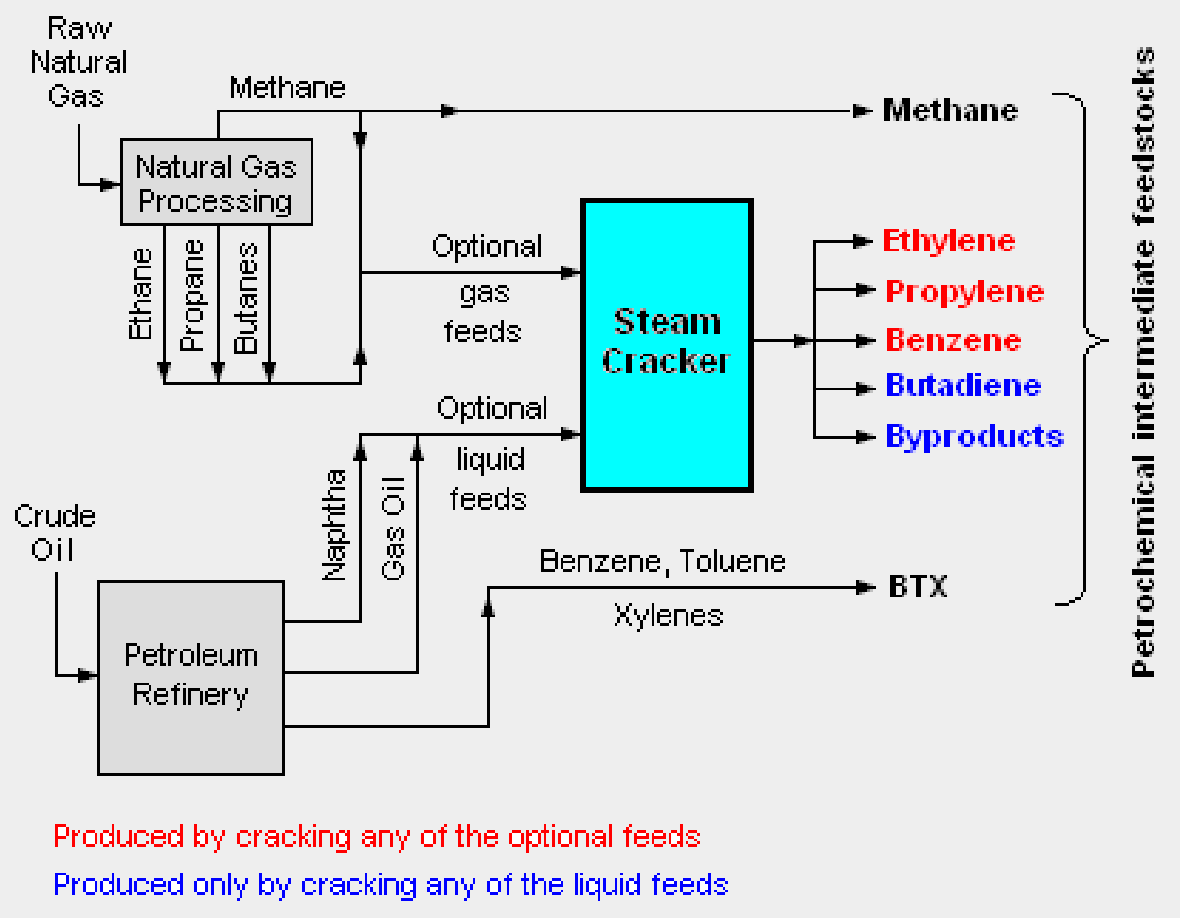

METHANEX, Medicine Hat

Feedstocks to

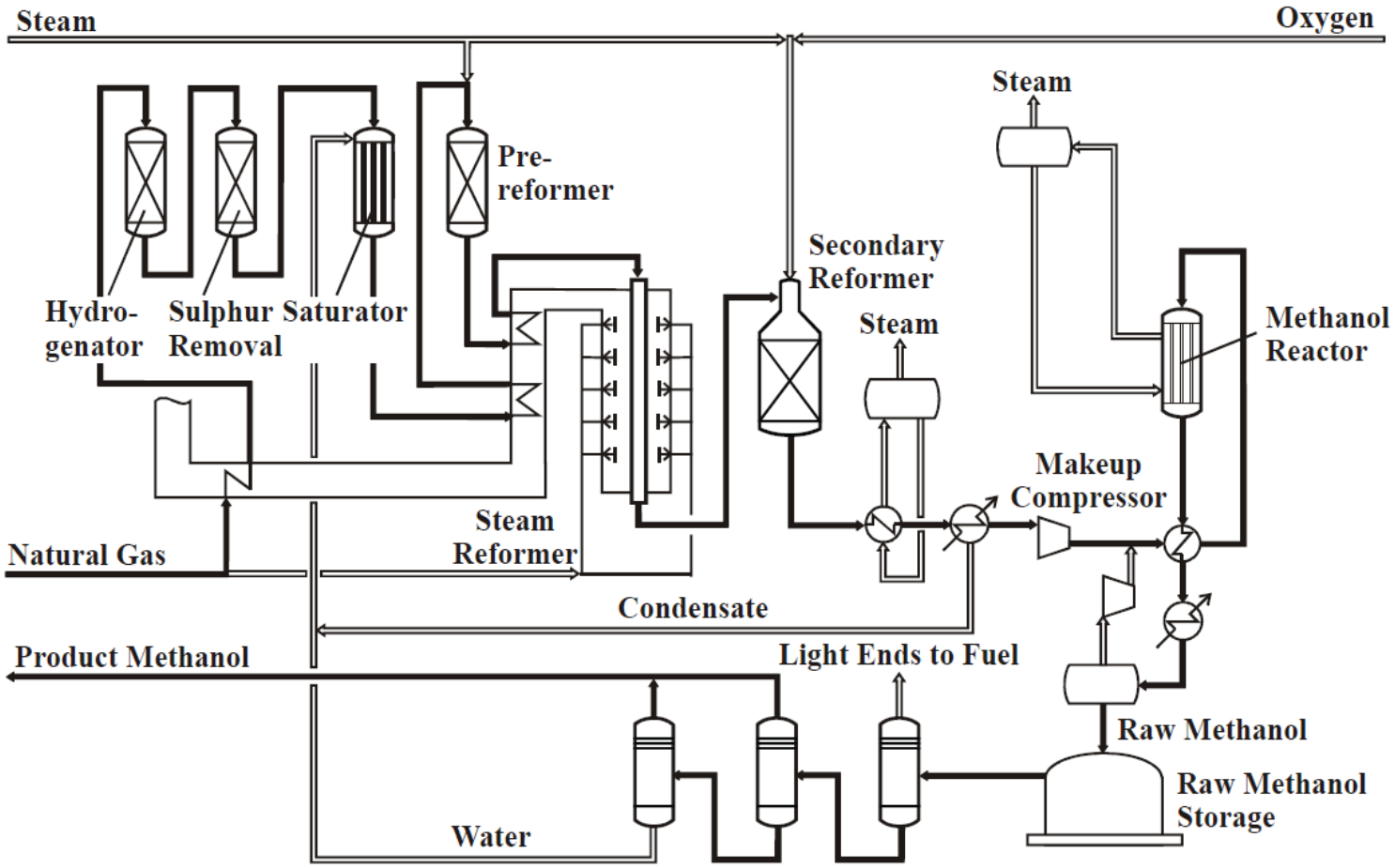
Large consumption in Alberta

Feedstocks and example petrochemical products						
methane	**ethylene**	**propylene**	**butenes and butadiene**	**benzene**	**toluene**	**xylenes**
hydrogen	polyethylene	polypropylene	styrene-butadiene rubber (SBR)	styrene	benzoic acid	phthalic anhydride
ammonia	ethanol	isopropanol	methyl *tert*-butyl ether (MTBE)	polystyrene	toluene diisocyanate	polyesters
methanol	ethylene glycol	propylene glycol	polybutadiene	phenol	polyurethanes	dimethyl terephthalate
methyl chloride	vinyl acetate	allyl chloride	acrylonitrile-butadiene-styrene (ABS)	cumene	caprolactam	terephthalate acid
carbon black	perchloroethylene	acrylonitrile	polybutenes	aniline	nylons	polyethylene terephthalate
acetylene	polyvinyl acetate	acrylic acid	methyl ethyl ketone (MEK)	adipic acid	polyureas	dioctyl phthalate
formaldehyde	glycol ethers	epoxy resins	*tert*-butanol	nylons		

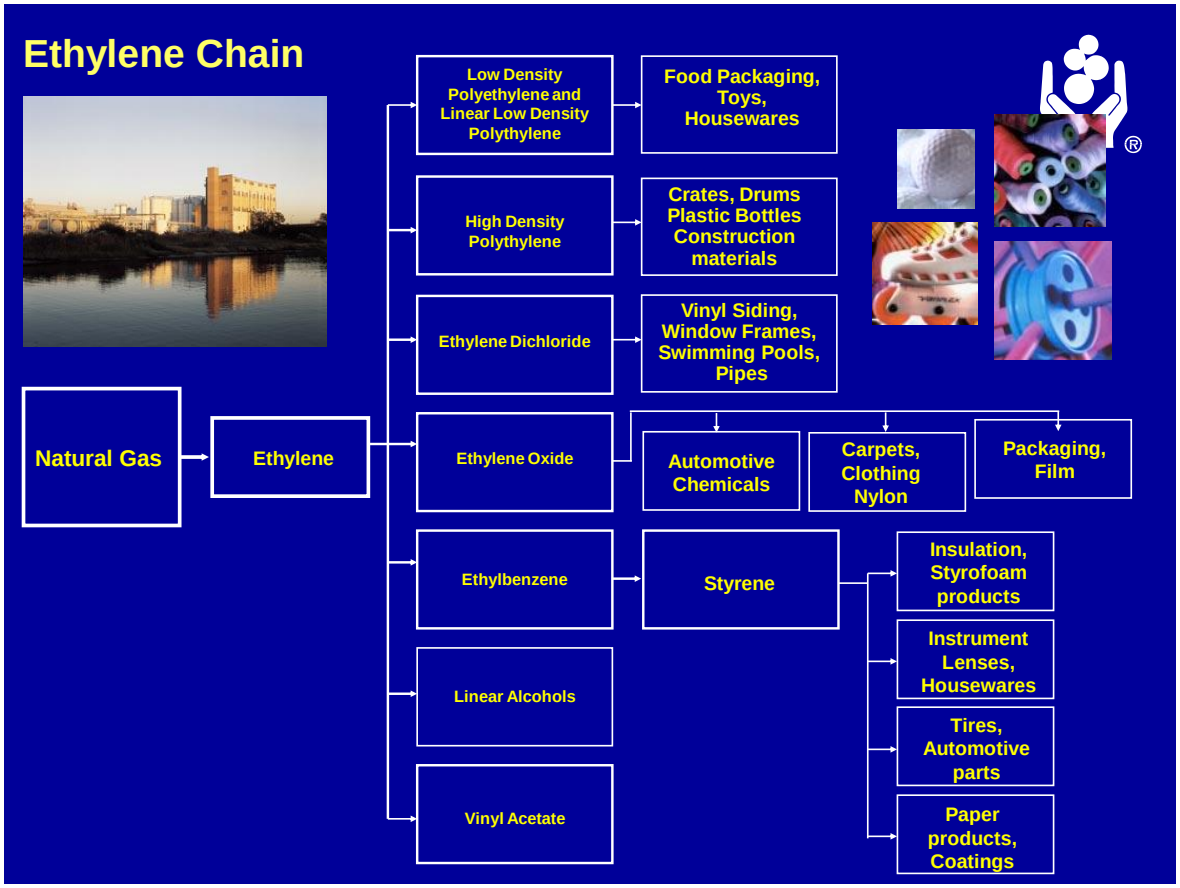
Value-Add – O&G to Ethylene



Value-Add – NG to Methanol



Value-Add – Ethylene End-Products



CIAC CEP Planning

- Importance of water quantity **AND** quality
- ”Conserve and efficiently use valuable resources” is a core requirement of RC
- RC commits member companies to continuous improvement and sustainability
- Let’s focus on WATER!

CIAC Water Use In General

- Critical to operations – raw material, steam, cooling
- Intake quantity, effluent volume and quality are regulated and monitored
- Intake water is treated (cleaned) for use
- Often, effluent quality is better than intake
- Cooling tower evaporative losses are included as consumption

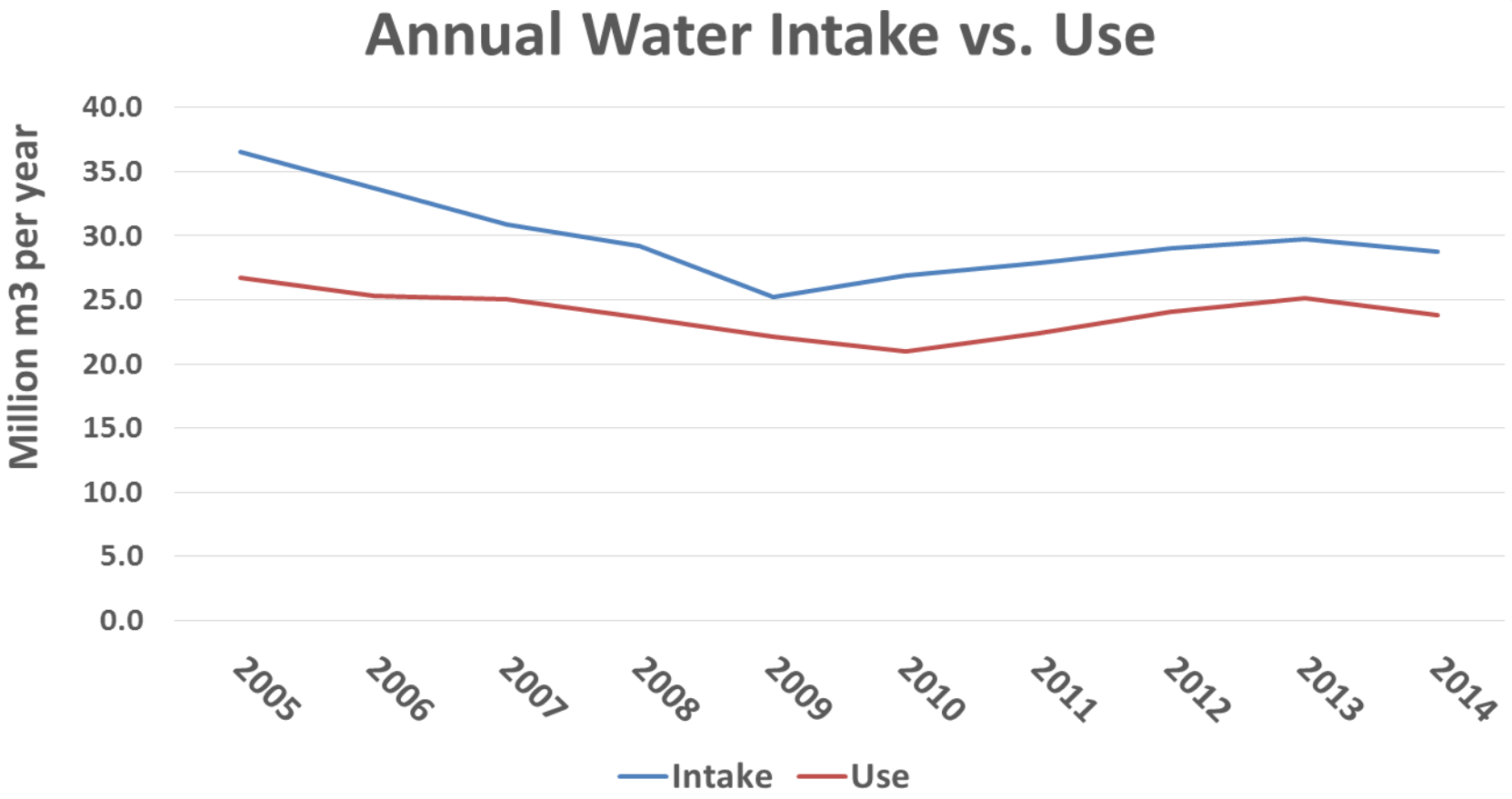
CIAC Water Use In General

- Assumption – small user is <10,000 m3/yr
- Discount small use and municipal water use
- Chemistry sector water use is relatively small
- 12 companies, 21 individual facilities
  – 2 co-gen facilities included in other site data
- Some company facilities share sites with others

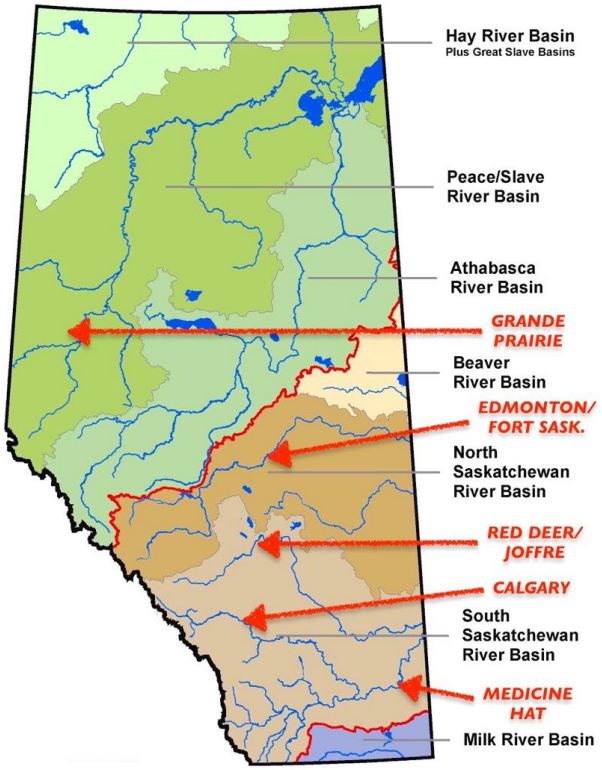
CIAC Water Use Profile

VOL. *(m3/yr)* USED	# OF FACILITIES	COMPANIES	WATER SOURCE/S
0–10k	5	Dow Ag Sciences, BASF (2), Nalco, CCC Group	either zero usage OR all sourced from municipal services
10–25k	2	National Silicates, Chemtrade	municipal services
25–100k	3	NOVA Calgary, Chemtrade (2)	NOVA (municipal) Chemtrade (1 municipal, 1 river)
100–999k	3	ERCO, INEOS, Evonik	surface
>1MM	7	NOVA, Dow (2), Shell, Methanex, MEGlobal (2)	NOVA, Dow, MEGlobal, Shell – surface Methanex – municipal aquifer/groundwater

CIAC Water Use 2005-2014



Alberta's Chemistry Hubs



Main watersheds involved

- Peace/Slave
- North Saskatchewan
- South Saskatchewan
  - Red Deer River sub-basin

CEP Tactics – Existing Facilities

- **C&E** –> Manage cooling water cycles, minimize make up
- **C&E** –> Consolidate wastewater streams, treat and re-use when technically possible
- **C** –> By-product or wastewater synergy
  – one company can recycle or use at another facility
- **E** –> Discharge sanitary wastewater to municipal facilities
- **C&E** –> Capture and recycle stormwater
- **C** –> Recycle boiler blowdown
- **E** –> Optimize boiler feed water treatment to minimize wastewater
- **C&P** –> De-bottleneck – increase production without increasing water use

CEP Tactics – New Facilities

- Choose the most efficient equipment possible – BATEA
- Implement metering and monitoring devices at appropriate locations
- Design water/steam balance with re-use and recycling opportunities in mind
- Share utilities with other facilities where possible

CEP Tactics – CIAC-wide

'Annual Water Use' reporting began in 2012

FACILITY	CITY	Facility Output *(in current year)*	Facility Collects Water Use Data *(Y/N)*	Water Consumption *(m3/yr)*	Surface Source Amount *(m3/yr)*	Source: Surface	Source: Municipal *(m3/yr)*	Source: Ground Water *(m3/yr)*	Facility Collects Stormwater *(Y/N)*
Site 1	Anytown1	30359	Y	20,324	0	S. Sask	20,324	0	N
Site 1	Anytown1	32249	Y	20,054	0	S. Sask	20,054	0	Y
Site 1	Anytown1	29791	Y	19,555	0	S. Sask	19,528	0	Y
Site 2	Anytown 2	28762	Y	47,372	47,372	N. Sask	0	0	N
Site 2	Anytown 2	33273	Y	44,500	44,500	N. Sask	0	0	Y
Site 2	Anytown 2	56290	Y	44,500	44,500	N. Sask	0	0	Y

Contact Us

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