



Empowering our future

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*Turning waste into sustainable energy solutions*

THE EFW SOLUTION



# IMAGINE...

IMAGINE...



*...a world without landfills*



## CORPORATE MISSION

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To provide commercially viable, clean energy solutions  
which successfully meet the challenges  
of sustainable development

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*Turning waste into sustainable energy solutions*

# Time for Change

- Key Drivers

- *Eliminate greenhouse gases*
- *Develop sustainable alternatives for waste management*
- *Generate efficient, affordable power for growth and economic development*
- *Eliminate landfill sites that can plague generations to come*
- *Create substantial social and economic benefit through the utilization of environmentally responsible technology*

*“Change is the law of life and those who look only to the past or present are certain to miss the future.”*

*John F. Kennedy*

# Our Focus

- A simple, proven design and operating strategy for processing municipal solid waste (MSW) –including plastics, medical waste and sewage—using patented and propriety technology.
- The resulting output has environmental, social and economic advantages



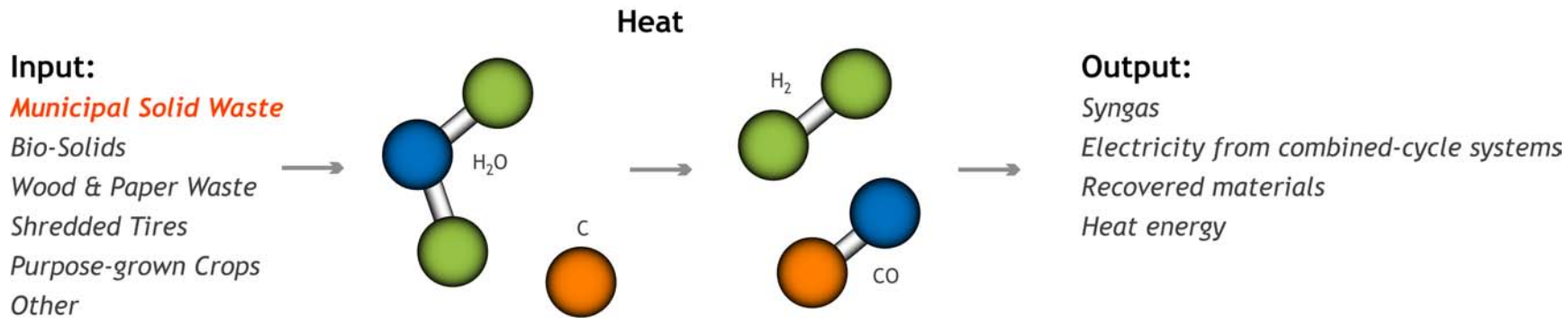
# The Advantages

- A non-incineration chemical conversion process
  - *The absence of oxygen avoids the formation of dioxins and furans*
- A unique opportunity to utilize waste material
  - *Typically 90%+ of mass and 98% of volume from input materials are converted to a useable synthetic gas (syngas)*
  - *Remainder are recoverable metals or inert aggregate material*
  - *All are marketable products*
  - *Eliminates the need for landfill*

# The Advantages

- Supports governmental initiatives for reducing greenhouse gases
  - *An opportunity to capitalize on carbon credits*
- A scalable process which is environmentally responsible
  - *Provides substantial savings to municipalities*
  - *Facilities may be located in close proximity to urban areas*
- Creates multiple revenue streams
  - *Including 'green' electrical power, industrial commodities and process heat*

# The Technology



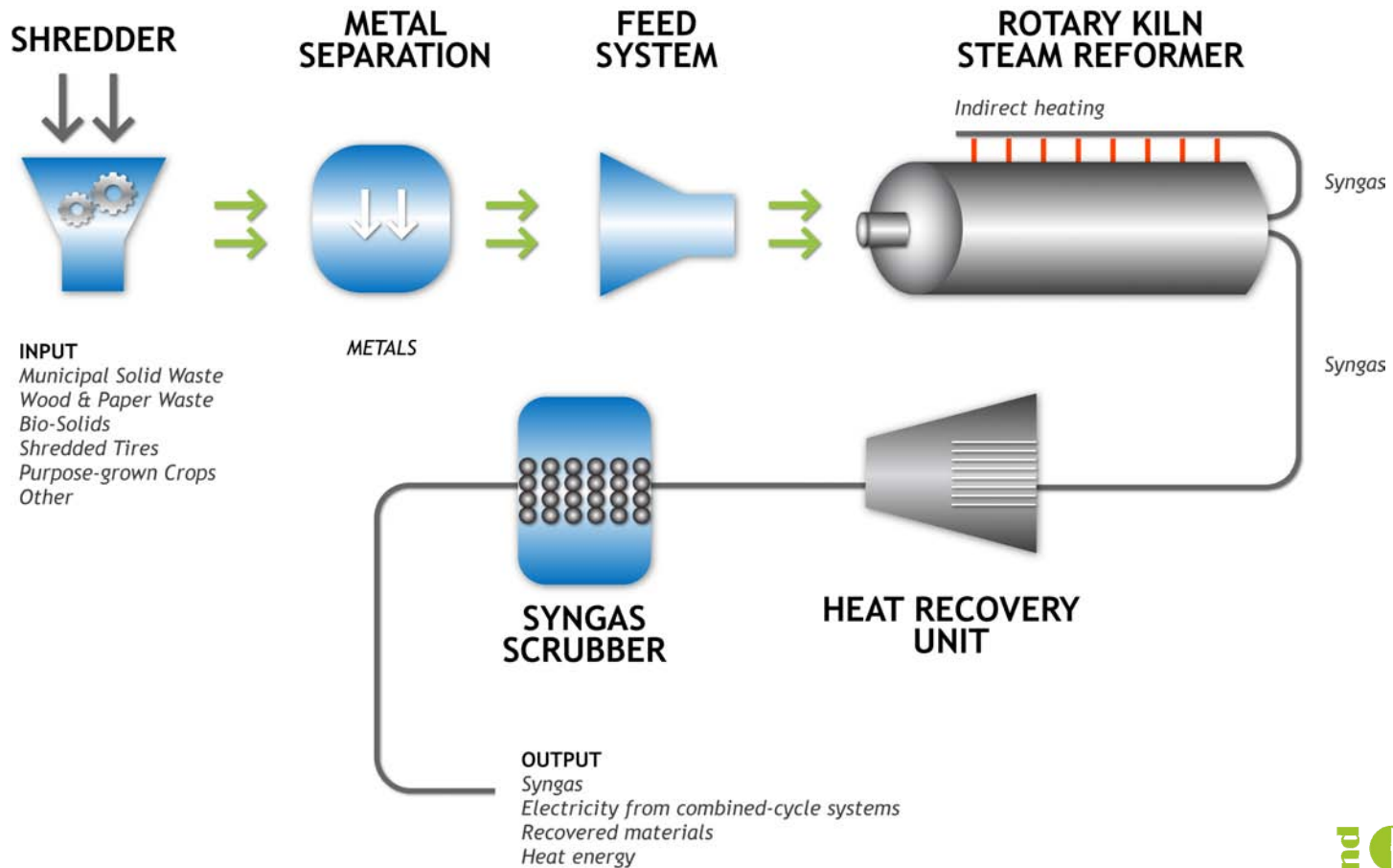
Carbonaceous material (C) reacts with steam (H<sub>2</sub>O) to form CO plus H<sub>2</sub>

- A unique chemical process, known as steam reformation (SR)
  - *Economical & energy-efficient relative to competitive systems*
    - Uses proven components and off-the-shelf equipment
    - Core component is an indirectly heated rotary kiln for syngas generation
    - Uses a small portion of the syngas produced to complete a self-sustaining system

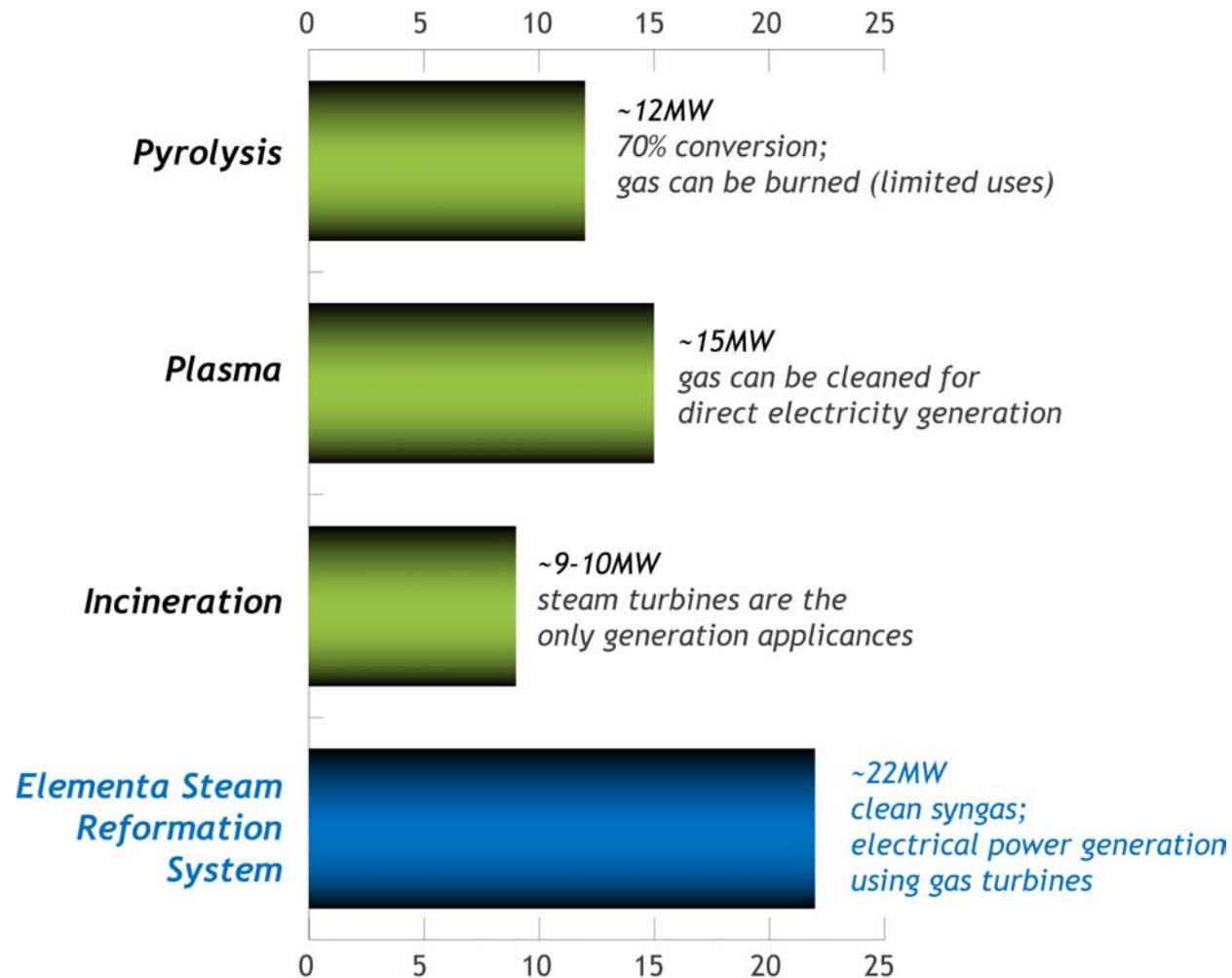


# Elementa Steam Reforming Technology

- Energy from Waste Process



# Technology Comparisons: 100K Tonne MSW System



# Elementa Steam Reforming Technology

- Comparison with Applicable Emission Limits

PARAMETER	UNIT	ALLOWABLE LIMITS (ONTARIO)	MEASURED (ELEMENTA)	% OF LIMIT
Total Hydrocarbons (as CH <sub>4</sub> )	<i>ppmvd</i>	50	1.7	3.4%
Carbon Monoxide	<i>ppmvd</i>	35	2	5.7%
Oxygen	<i>&gt;6% by volume</i>	>6%	8.3	OK
Suspended Particulate Matter	<i>mg/R.m<sup>3</sup> @ 11%O<sub>2</sub></i>	17	0.34	2.0%
Dioxins/Furans (as TEQ)	<i>pg/R.m<sup>3</sup> @ 11%O<sub>2</sub></i>	80	1.9	2.4%
Hydrochloric Acid	<i>ppmvd @ 11%O<sub>2</sub></i>	18	0.41	2.3%
Nitrogen Oxides (as NO <sub>2</sub> )	<i>ppmvd @ 11%O<sub>2</sub></i>	110	86.2	78%*
Sulphur Dioxide	<i>ppmvd @ 11%O<sub>2</sub></i>	21	3	14%
Cadmium	<i>µg/ R.m<sup>3</sup> @ 11%O<sub>2</sub></i>	14	0.040	0.29%
Lead	<i>µg/ R.m<sup>3</sup> @ 11%O<sub>2</sub></i>	142	0.63	0.44%
Total Mercury	<i>µg/ R.m<sup>3</sup> @ 11%O<sub>2</sub></i>	20	0.14	0.70%

\*Test equipment created high level, not the syngas. Will be managed below 25%

# Elementa Steam Reforming Technology

- Air Emission Performance
  - *Elementa benchmarks its emissions against world class standards*

PARAMETER	UNIT	STANDARDS			
		EU	CALIFORNIA	CANADA (ONTARIO A-7)	ELEMENTA
Particulate Matter	mg/Nm <sup>3</sup>	9	16	17	0.34
Cadmium	µg/Nm <sup>3</sup>	46	10	14	0.04
Lead	µg/Nm <sup>3</sup>	n/a	140	142	0.63
Mercury	µg/Nm <sup>3</sup>	46	60	20	0.14
Dioxins and Furans	ng/Nm <sup>3</sup>	0.092	9	0.08	0.002
Hydrochloric Acid	mg/Nm <sup>3</sup>	9	27	27	0.59
Sulphur Dioxide	mg/Nm <sup>3</sup>	46	56	56	8
Nitrogen Oxides	mg/Nm <sup>3</sup>	183	202	207	177*
Organic Matter	mg/Nm <sup>3</sup>	9	n/a	66	1.214

\*Test equipment created high level, not the syngas. Will be managed below 25%

# Summary: Elementa Steam Reforming Technology

- Syngas Conversion to Electricity 45%
- Waste Volume Reduction 98%
- Dioxins and Furans (as measured) 2.4%

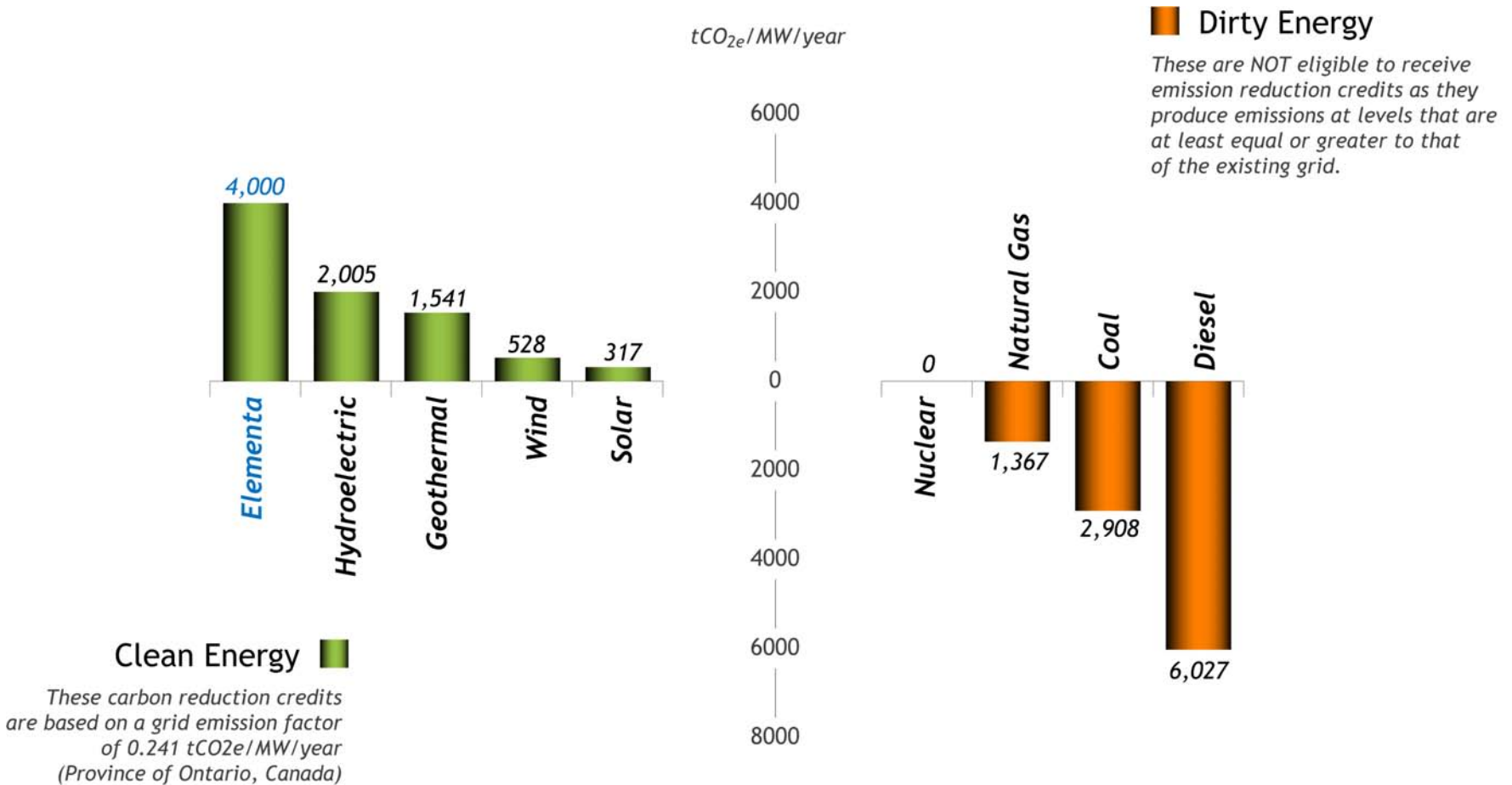


# Summary

- IGE proposes a modern and highly sustainable approach to EFW, offering social and environmental excellence
- Elementa's proven systems & equipment, superior performing chemistry, and robust design create a clean and widely useable renewable energy source
- IGE's solutions, with Elementa's technologies, are designed to surpass environmental compliance; minimize emissions, and reduce greenhouse gases & waste by-products



# Carbon Credits Comparison Chart



# In Conclusion

- IGE offers a diverse model tailored to meet customer needs
- IGE considers all business opportunities including joint venture projects as well as public and private partnering
- IGE focuses on developing renewable energy solutions and is committed to sustainable development, social responsibility and environmental betterment



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