

# Renewable Energy

Where are we situated and where are we going to?

# A comprehensive overview of the Renewable Energy market

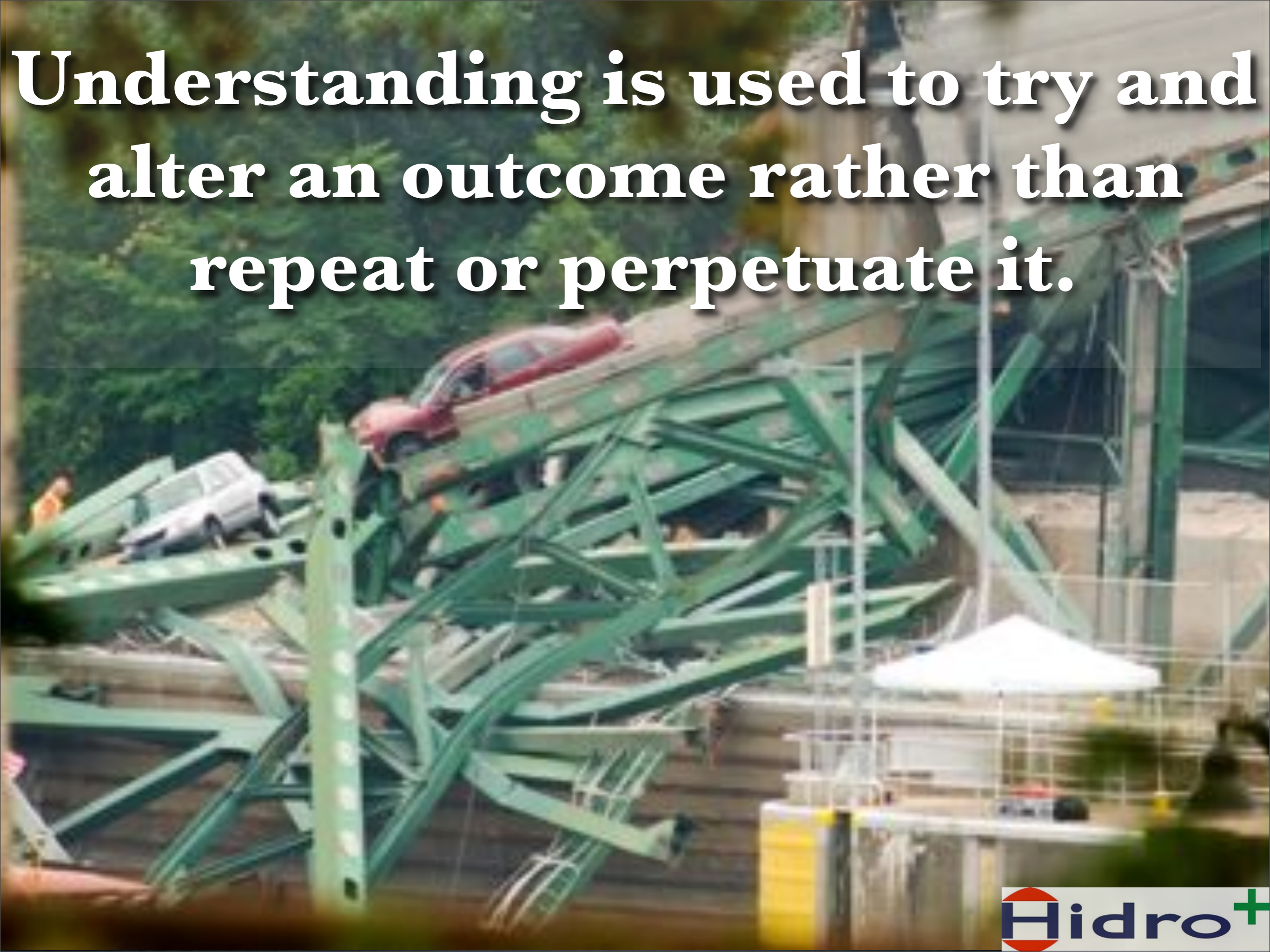
- Bio-char
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Save the Earth

## **Renewable Energy definition:**

1. capable of being renewed.
2. (of energy or its source) not depleted when used.

**Understanding is used to try and alter an outcome rather than repeat or perpetuate it.**



# BioChar

Use Old-tyre, Woody/Timber processes)  
Non-Energy generation absorbs at soil Methane (CH<sub>4</sub>), NO<sub>2</sub>

Has it been tested and proved?	Yes
Is it commercially ready?	partly possible
If not commercially ready, when?	Unknown
Patents?	Yes various holders
Average power output per day?	N/A
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes on processing
Does it produce waste?	Yes on processing
If so, does waste involves processing?	Yes
Is there any transmission-losses?	N/A
<b>Is it Renewable Energy?</b>	<b>x, N/A</b>
Is it reliable and predictable source?	N/A
Does it produces carbon positive?	N/A
What is plant ~cost/MW?	Unknown
<b>What is the problem?</b>	<b>Significant salient hazards</b>
	<b>Feedstock Unsustainable</b>
	<b>Unknown outcomes</b>

# Bio-diesel

Ethanol, Algae, Palm-oil, Sugarcane, Jatropha, Corn; Oily-seeds, Succulent Plants etc

Has it been tested and proved?	YesYes
Is it commercially ready?	x
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	Yes
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes
Does it produces carbon positive?	No on Ethanol
What is plant ~cost/MW?	~\$4M/MW
<b>What is the problem?</b>	<b>Feedstock unsustainable,</b>
	<b>Water use unsustainable</b>
	<b>Expensive</b>

# Biogas

Bio genic fuel, Landfills, Bio-digester of MSW and Sludges

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	~90%
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes, partly
<b>Is it Renewable Energy?</b>	<b>No</b>
Is it reliable and predictable source?	Yes
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	~\$3M/MW
<b>What is the problem?</b>	<b>Emits Nox, Sox</b>

# Biomass

Green waste, Wood pellets, Agriculture byproducts, Plantations

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	~90%
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes
Does it produces carbon positive?	Yes, partly
What is plant ~cost/MW?	~\$4M/MW
<b>What is the problem?</b>	<b>Feedstock Unsustainable</b> <b>Water use Unsustainable</b>

# Carbon Capture Storage (CCS)

Coal Fuel Power Station minus CO<sub>2</sub> extraction and deep burial  
Necessary to also include complete life-cycle of a Coal Fuel Plant.

Has it been tested and proved?	No
Is it commercially ready?	No
If not commercially ready, when?	10-20 Years
Patents ?	Yes various holders
Average power output per day?	x
Does it need feedstock?	Yes for coal fuel power station
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes for coal fuel power station
<b>Is it Renewable Energy?</b>	<b>No</b>
Is it reliable and predictable source?	N/A
Does it produces carbon positive?	No
What is plant ~cost/MW?	~\$1BN/plant + cost of coal fuel plant
<b>What is the problem?</b>	<b>Significant salient hazards</b>
	<b>Expensive, Unaffordable</b>
	<b>Water Use Unsustainable</b>
	<b>Unknown Future</b>

# Coal Seam Gas

Natural formation, underground Pyrolysis/Gasification

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	mine infrastucture
Patents?	Yes various holders
Average power output per day?	~90%
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes, at mine
If so, does waste involves processing?	Yes, at mine
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>No</b>
Is it reliable and predictable source?	Yes
Does it produces carbon positive?	No
What is plant ~cost/MW?	~\$2.5-3.5M/MW
<b>What is the problem?</b>	<b>Acceptable as pool solution</b>

# Geothermal- 1. by volcanic

Natural occurrence

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents ?	Yes various holders
Average power output per day?	~90%
Does it need feedstock?	No
Does it need water?	Yes
Does it gives emit any emissions?	No
Does it produce waste?	No
If so, does waste involves processing?	x
Is there any transmission-losses?	Yes, significant
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes partly
Does it produces carbon positive?	Yes
What is plant ~cost/MW?	~\$4.5M/MW
<b>What is the problem?</b>	<b>Acceptable as pool solution</b>
	<b>Limited Source Availability</b>
	<b>Depletes ground water</b>

# Geothermal- 2. Hot Rocks

Hot rocks to produce SHsteam

Has it been tested and proved?	On-going
Is it commercially ready?	No
If not commercially ready, when?	Years
Patents ?	Yes various holders
Average power output per day?	~90%
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	No
Does it produce waste?	No
If so, does waste involves processing?	x
Is there any transmission-losses?	Yes, if proven
<b>Is it Renewable Energy?</b>	<b>Yes, if proven</b>
Is it reliable and predictable source?	Unknown
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	~\$8M/MW
<b>What is the problem?</b>	<b>Expensive, Unaffordable</b>
	<b>Water Use Unsustainable</b>
	<b>Significant Salient Hazards</b>



## Hydrodynamic Cycle, Deep Water Pressure Energy Conversion

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	n/a
Patents?	<b>Yes, sole holder Mr James Kwok</b>
Average power output per day?	100%
Does it need feedstock?	No
Does it need water?	No
Does it gives emit any emissions?	No
Does it produce waste?	No
If so, does waste involves processing?	n/a
Is there any transmission-losses?	No
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes
Does it produces carbon positive?	Yes
What is plant ~cost/MW?	~\$2.5M/MW
<b>What is the problem?</b>	<b>No adverse impacts</b>
	<b>Acceptable as pool solution</b>

# Hyrodam

Hydro-scheme, Hydroelectric

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	~40%
Does it need feedstock?	Yes
Does it need water?	Yes, significant
Does it gives emit any emissions?	No
Does it produce waste?	No
If so, does waste involves processing?	x
Is there any transmission-losses?	Yes, significant
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	No, hang to rainfalls
Does it produces carbon positive?	Yes
What is plant ~cost/MW?	~>\$8M/MW
<b>What is the problem?</b>	<b>Feedstock Unsustainable</b>
	<b>Water Use Unsustainable</b>
	<b>Acceptable pool solution</b>

# Hydrogen

Fuelcells, Photolysis, Radiolysis,Hydrolysis, Turbogenerator/Engine- fuel combustion

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	~90% on small capacity
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes on large capacity
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes, partly on small cap
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	~\$8M/MW
<b>What is the problem?</b>	<b>Expensive, Unaffordable</b>
	<b>Small Cap Only</b>

# Jetstream @ Stratosphere

Has it been tested and proved?	No
Is it commercially ready?	No
If not commercially ready, when?	Years or decades
Patents?	Yes various owners
Average power output per day?	x
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Unknown</b>
Is it reliable and predictable source?	Unknown
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	Unknown
<b>What is the problem?</b>	<b>Unknown Outcomes</b>

# Nuclear

U238, U233, Isotopes, Plutonium, Thorium

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	~90%
Does it need feedstock?	Yes
Does it need water?	Yes
Does it give emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes, RA-wastes
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>No</b>
Is it reliable and predictable source?	Yes
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	~>\$10M/MW
<b>What is the problem?</b>	<b>Expensive, Unaffordable Significant salient hazards Unsustainable Water Use</b>

# Ocean Thermal

Temperature Gradient, Heat Storage (Molten Na-liquid), Refrid-cycle

Has it been tested and proved?	Yes
Is it commercially ready?	No
If not commercially ready, when?	Years
Patents?	Yes various holders
Average power output per day?	x
Does it need feedstock?	x
Does it need water?	x
Does it gives emit any emissions?	x
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Unknown
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	Unknown
<b>What is the problem?</b>	<b>Unknown Future</b>

# Road Hydraulic Pump

Has it been tested and proved?	No
Is it commercially ready?	No
If not commercially ready, when?	Years or decades
Patents?	Yes various holders
Average power output per day?	x
Does it need feedstock?	Yes
Does it need water?	Yes
Does it gives emit any emissions?	Yes
Does it produce waste?	Yes
If so, does waste involves processing?	Yes
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Unknown</b>
Is it reliable and predictable source?	Unknown
Does it produces carbon positive?	Unknown
What is plant ~cost/MW?	Unknown
<b>What is the problem?</b>	<b>Unknown Outcomes</b>

# Solar Energy

Solar PV, Solar Concentrator and Heat Storage ( heliostat)

Status Description: PV= converts into electrical

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	N/A
Patents?	Yes, various holders
Average power output per day?	~30%max
Does it need feedstock?	No
Does it need water?	No
Does it gives emit any emissions?	No
Does it produce waste?	Yes, used batteries
If so, does waste involves processing?	Yes, in recycling process
Is there any transmission-losses?	Yes, on large capacity
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	No
Does it produces carbon positive?	Yes, over period of time
What is plant ~cost/MW?	\$12K/KW; \$8M/MW
<b>What is the problem?</b>	<b>Low Availability; Expensive</b>

# Water Fusion

Plasma Magnetic: Deuterium 1part in 10,000th

Has it been tested and proved?	No
Is it commercially ready?	No
If not commercially ready, when?	Years or decades
Patents?	Yes various holders
Average power output per day?	X
Does it need feedstock?	X
Does it need water?	X
Does it gives emit any emissions?	X
Does it produce waste?	X
If so, does waste involves processing?	X
Is there any transmission-losses?	X
<b>Is it Renewable Energy?</b>	<b>Unknown</b>
Is it reliable and predictable source?	X
Does it produces carbon positive?	X
What is plant ~cost/MW?	X
<b>What is the problem?</b>	<b>Unknown Future</b>

# Wave Energy

Sea-tidal, Under sea current, Gulf streams

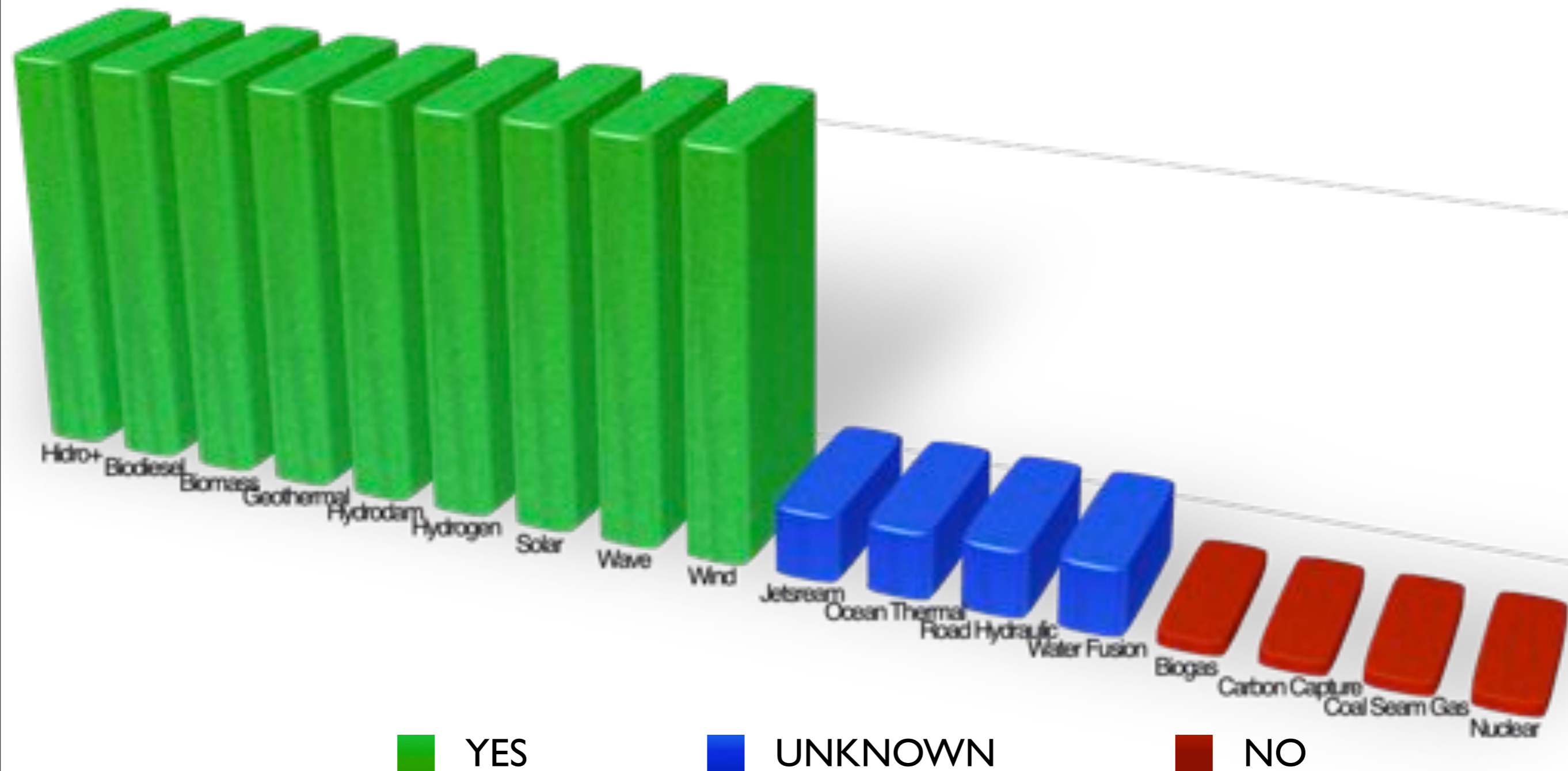
Has it been tested and proved?	On-going
Is it commercially ready?	Partly possible
If not commercially ready, when?	Years
Patents?	Yes, various owners
Average power output per day?	~50%
Does it need feedstock?	x
Does it need water?	x
Does it gives emit any emissions?	No
Does it produce waste?	No
If so, does waste involves processing?	x
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes, partly
Does it produces carbon positive?	Yes, over period of time
What is plant ~cost/MW?	~\$6M/MW
<b>What is the problem?</b>	<b>Low Power Availability</b>
	<b>Unknown Future</b>

# Wind Energy

On and off Shore, Roadside-passes, Fitted to cargo ships etc

Has it been tested and proved?	Yes
Is it commercially ready?	Yes
If not commercially ready, when?	x
Patents?	Yes various holders
Average power output per day?	~30%
Does it need feedstock?	No
Does it need water?	No
Does it gives emit any emissions?	No
Does it produce waste?	No
If so, does waste involves processing?	x
Is there any transmission-losses?	Yes
<b>Is it Renewable Energy?</b>	<b>Yes</b>
Is it reliable and predictable source?	Yes, partly
Does it produces carbon positive?	Yes, over period of time
What is plant ~cost/MW?	~\$3.5M/MW
<b>What is the problem?</b>	<b>Low Availability; Expensive</b>

# Is it Renewable Energy?

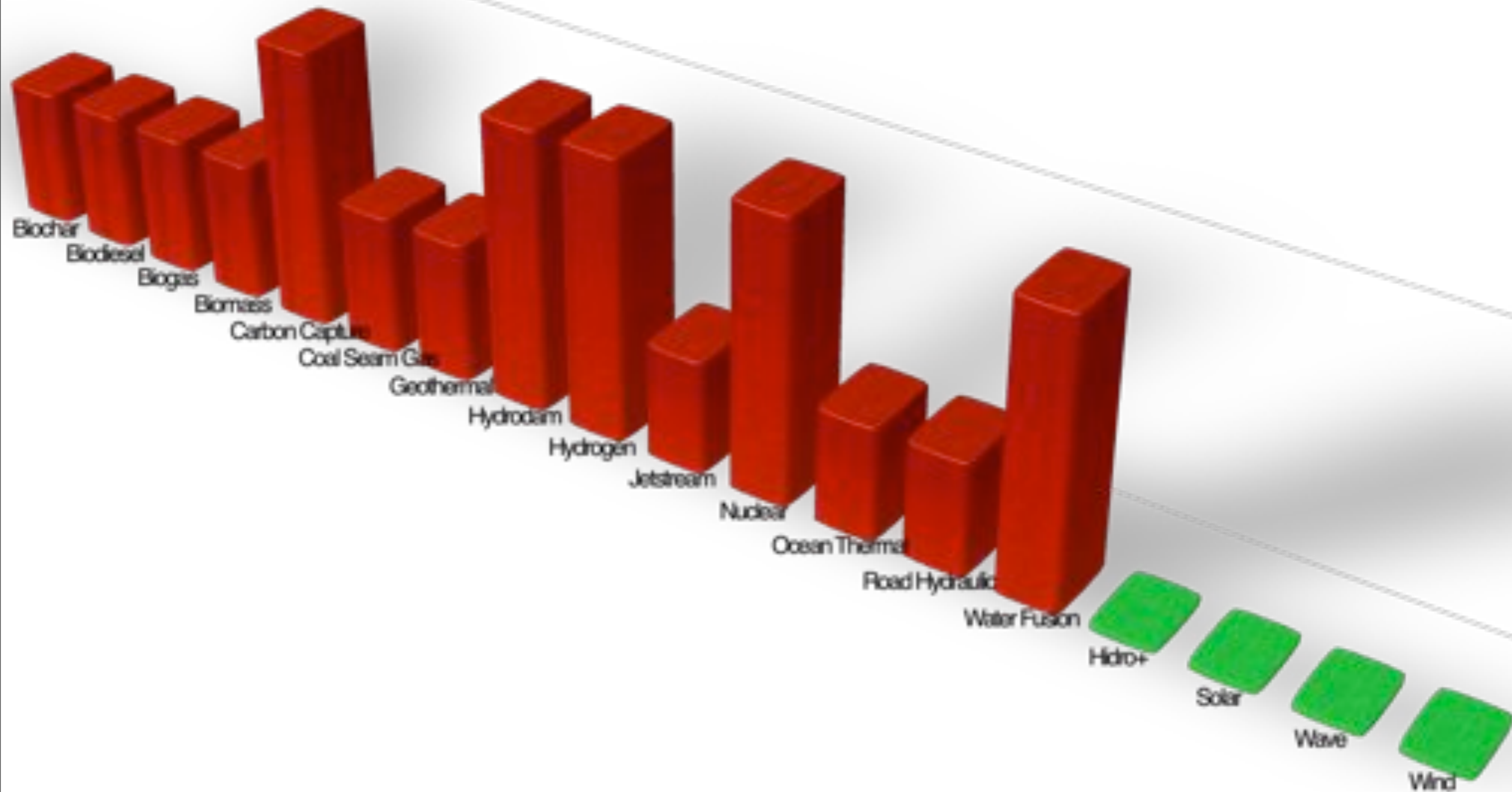


# Does energy require fresh water or desalinated water?

for processing, washing, cooling, growing feedstock, waste disposal

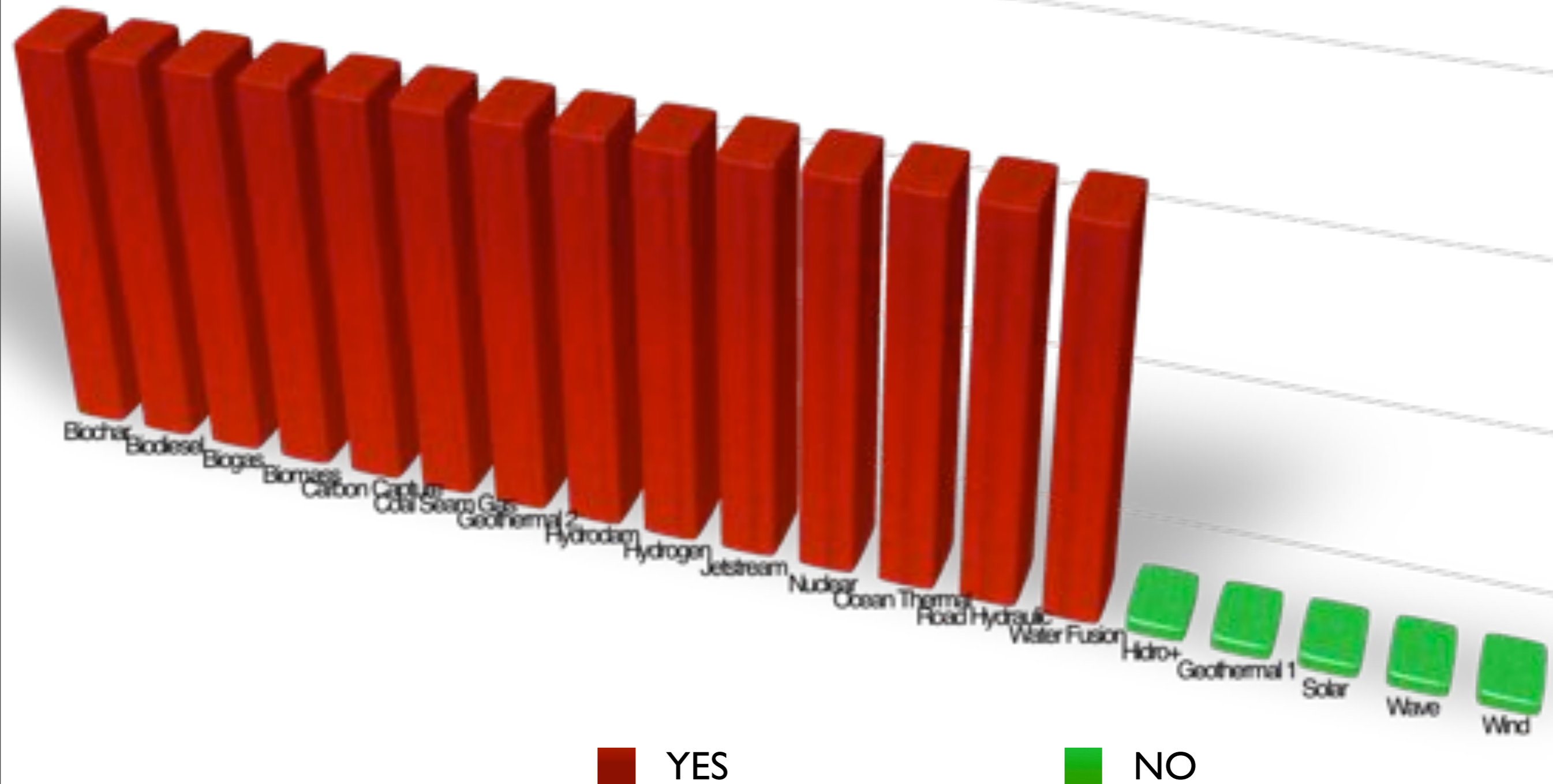
■ YES

■ NO

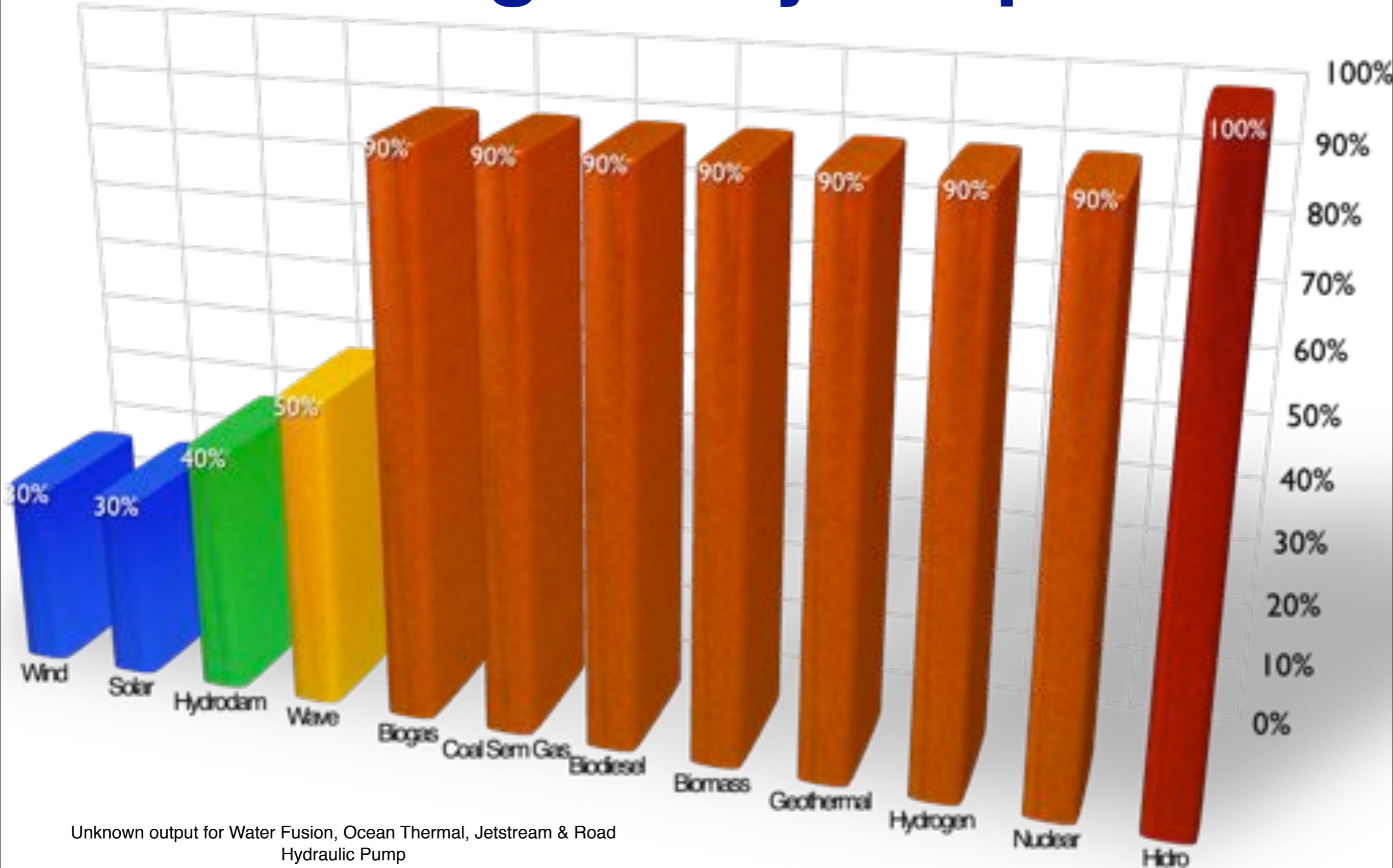


# Does it require feedstock?

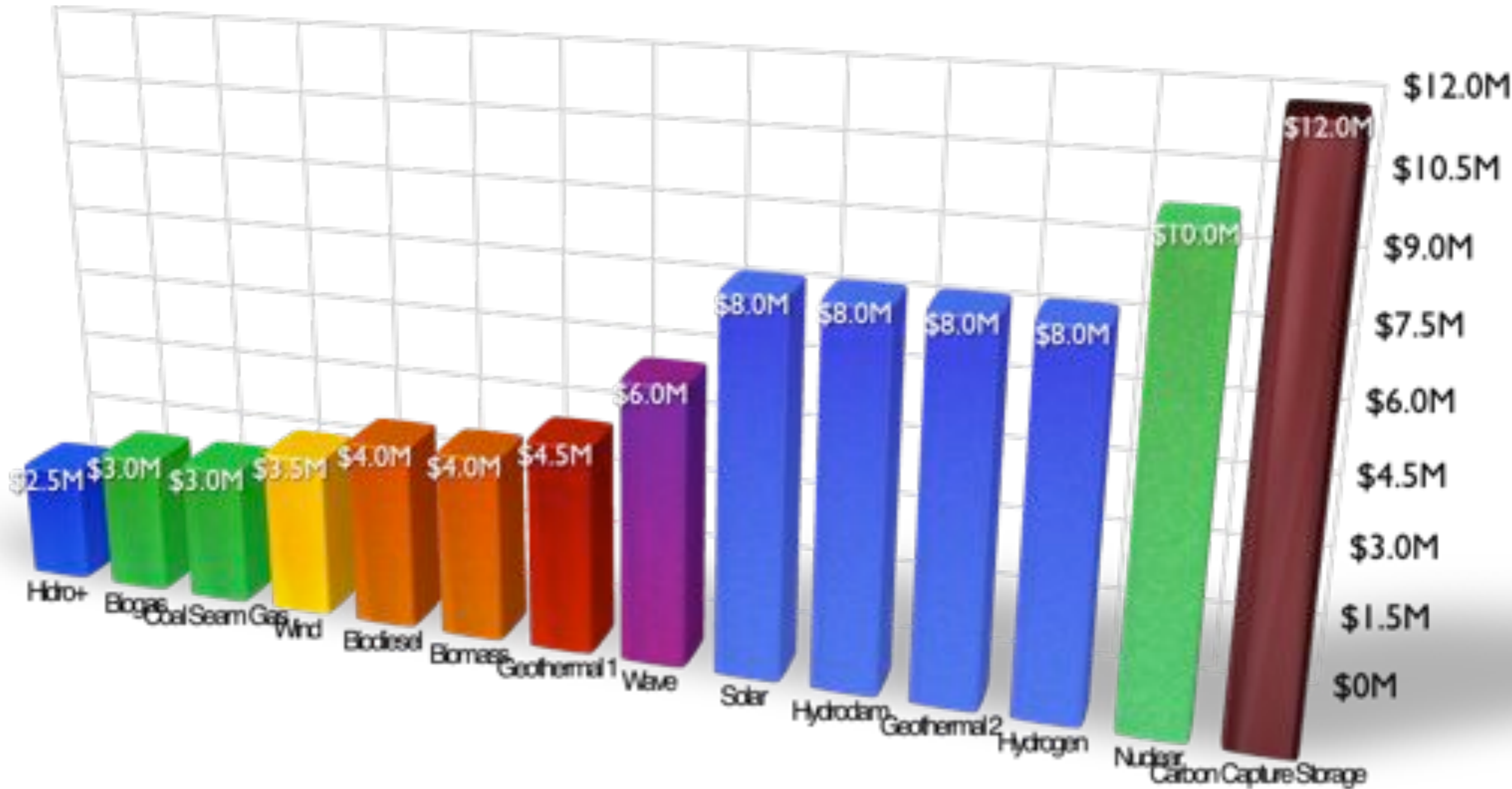
raw materials to fuel the industrial machine or process?



# Average Daily Output



# Cost per Mega-Watt



\*Unknown finished cost of carbon capture necessary to also include cost of coal fuel plant  
Unknown cost Water Fusion, Biochar, Ocean Thermal, Jetstream, Road Hydraulic Pump

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Power Generation to alter  
outcomes and make  
sustainable changes for  
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