Mainspring

AMMONIA ENERGY ASSOCIATION

Ammonia for Power Generation

A new, efficient, low-emissions generator made possible with software enabled technology and precise flameless reaction control

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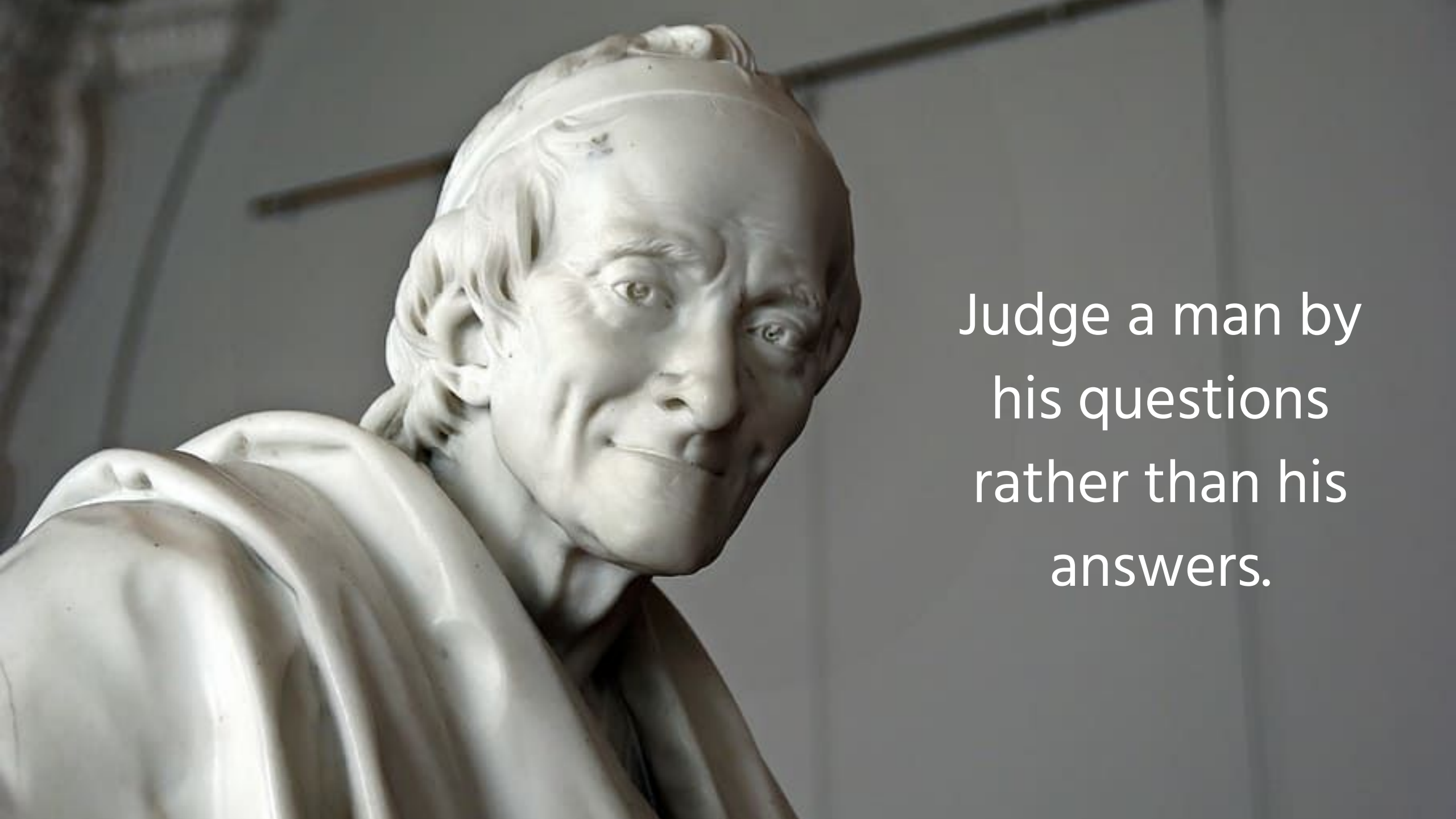
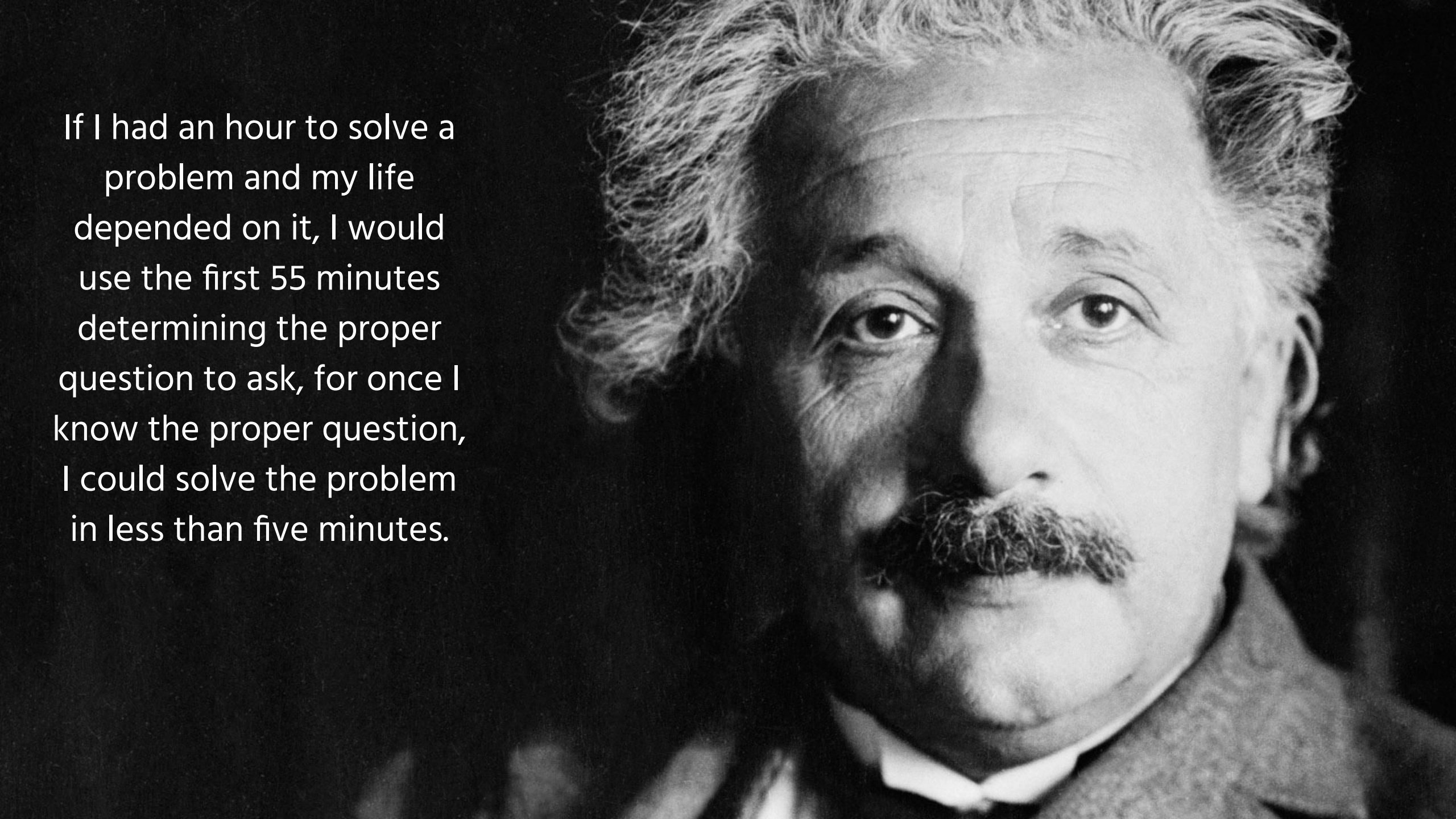
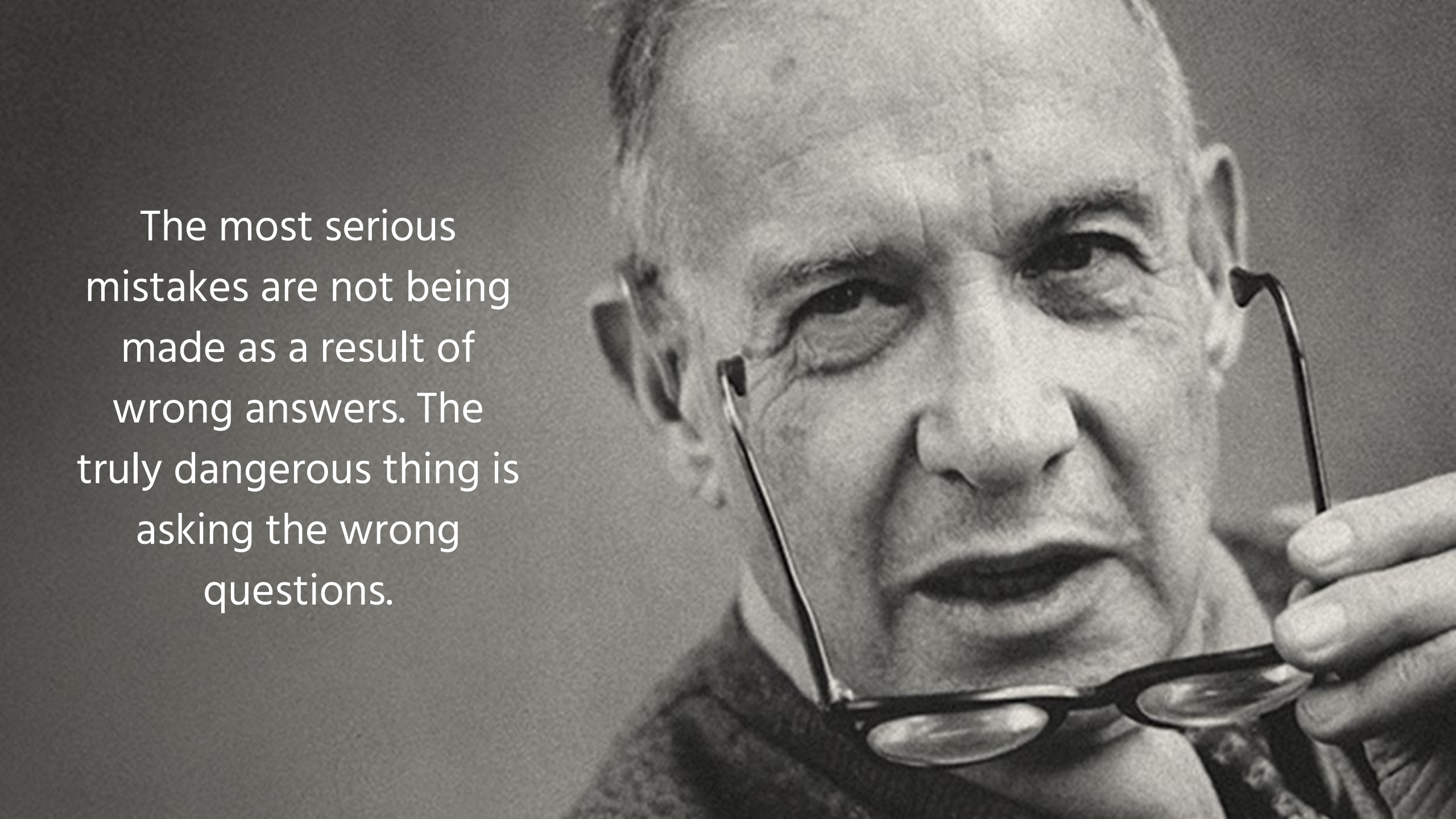
Vice President, Product

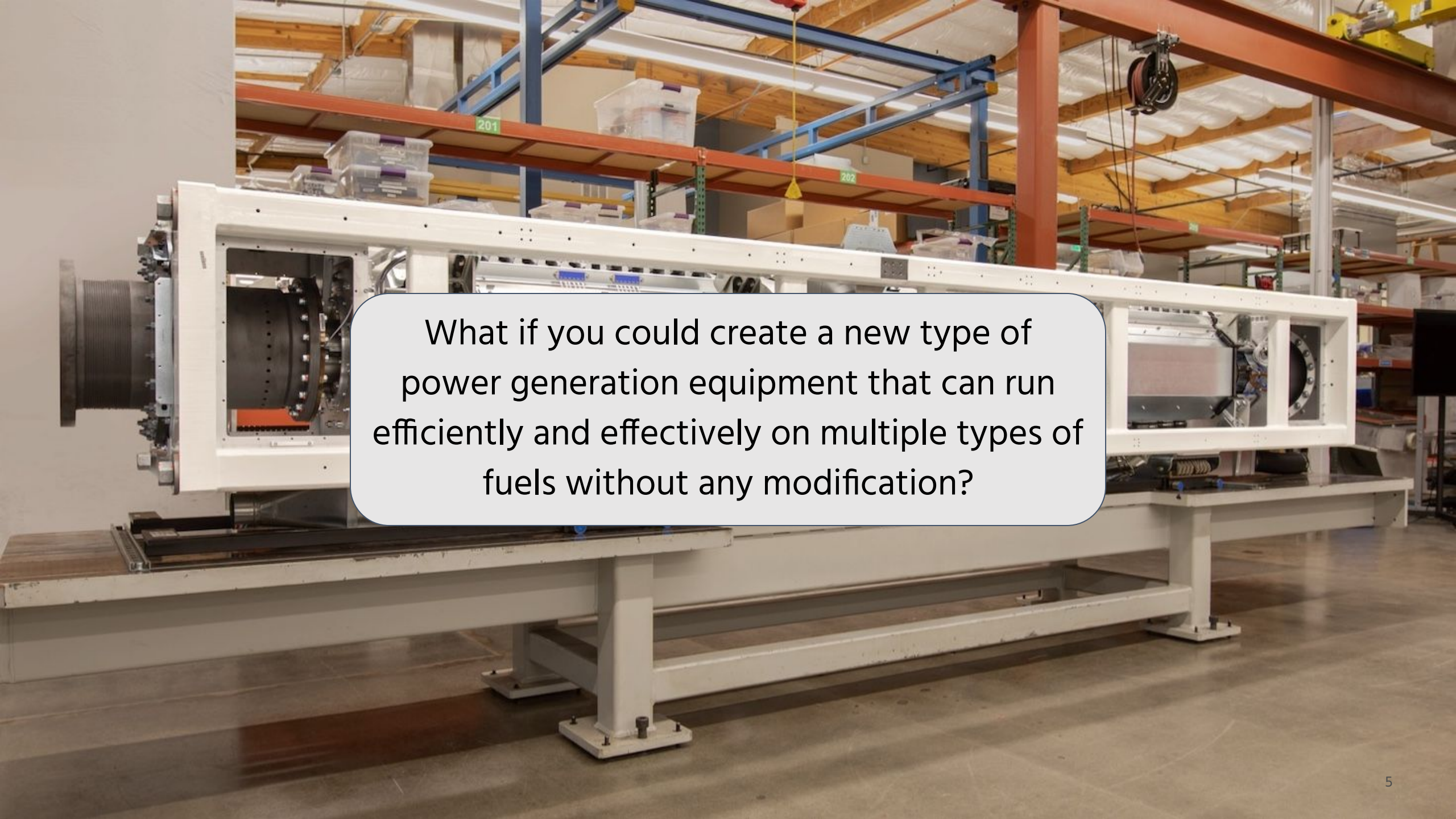

Judge a man by
his questions
rather than his
answers.

If I had an hour to solve a problem and my life depended on it, I would use the first 55 minutes determining the proper question to ask, for once I know the proper question, I could solve the problem in less than five minutes.

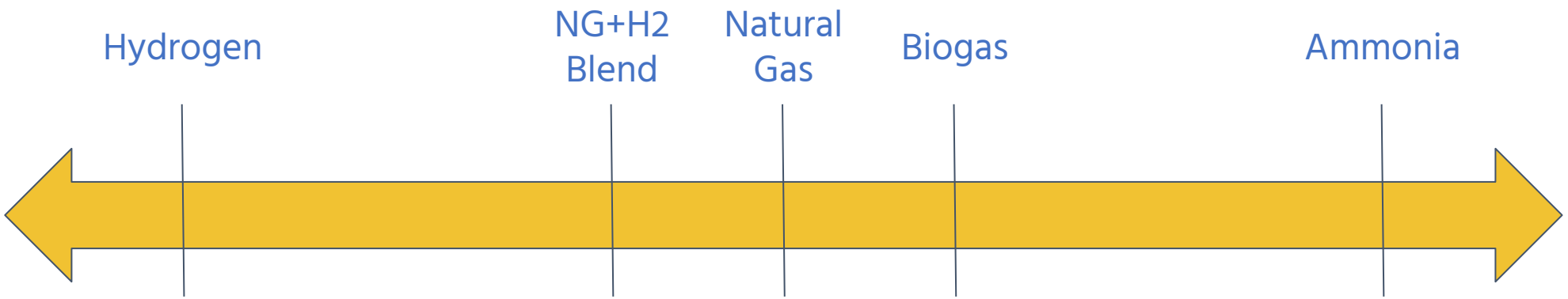


The most serious mistakes are not being made as a result of wrong answers. The truly dangerous thing is asking the wrong questions.




What if you could create a new type of power generation equipment that can run efficiently and effectively on multiple types of fuels without any modification?

Different Fuels Have Different Characteristics



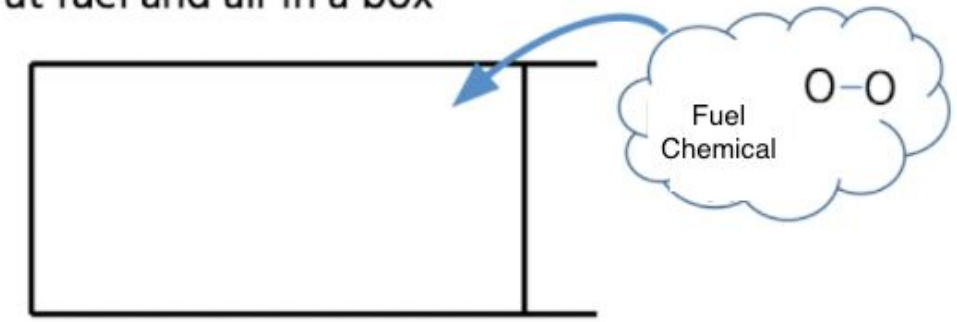
Easier to initiate, faster reaction

Harder to initiate, slower reaction

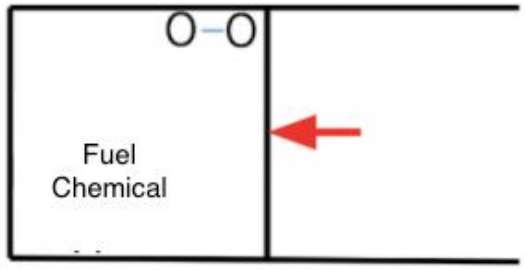
How do you deal with this level of fuel variability with a single set of hardware?

You Turn It Into a Software Problem: Mainspring Reaction Control Basics

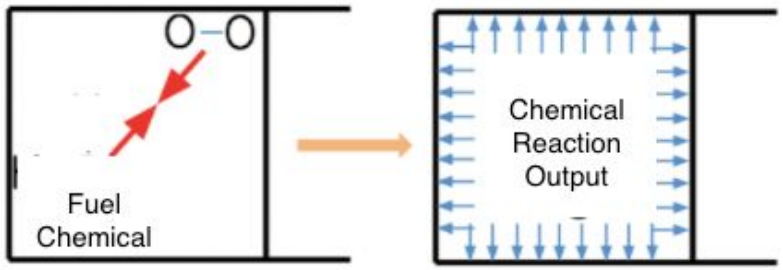
1. Put fuel and air in a box



2. Squeeze the box

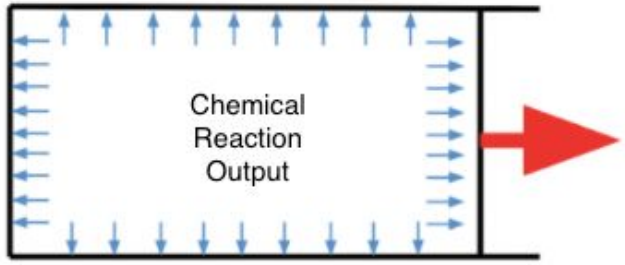


3. As the box walls push molecules together, they bonk faster and more often...



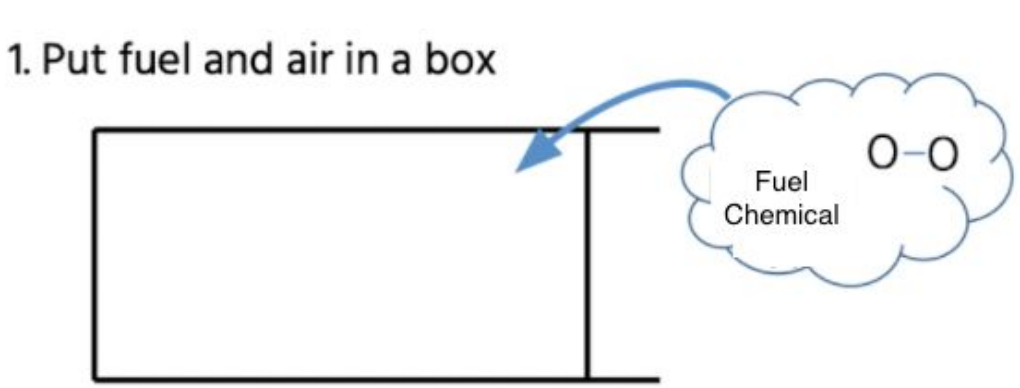
...until they fall apart and rearrange, releasing energy, so they push even harder against the walls

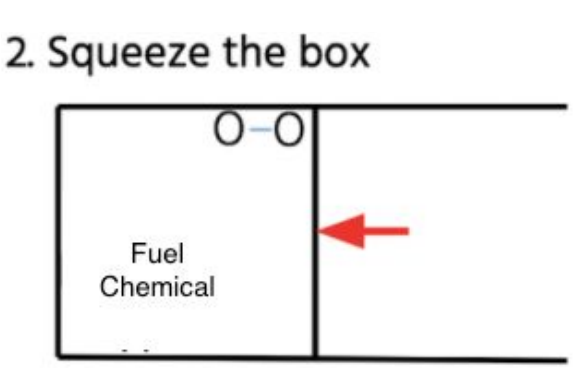
4. Harder push now means when the box expands...

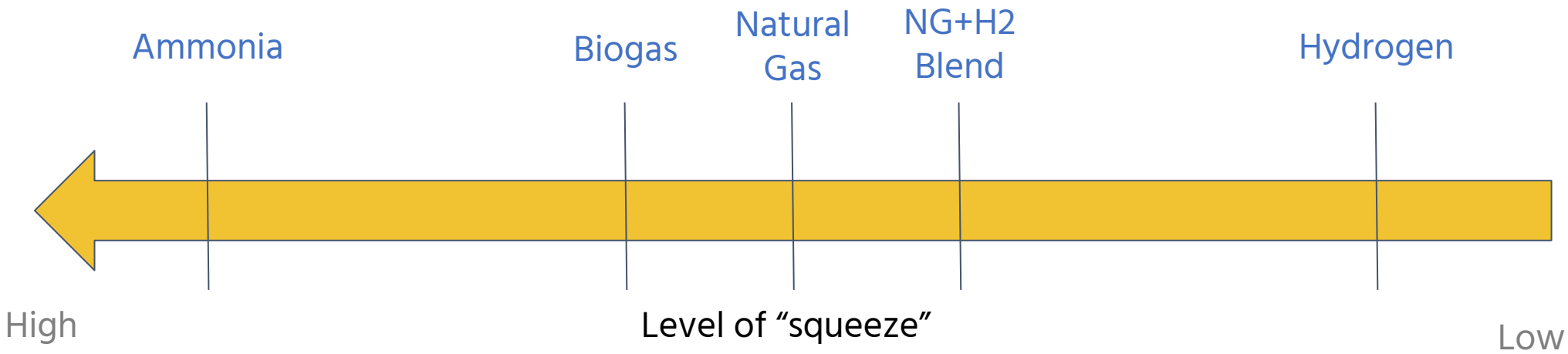


more force is applied outward than was put in during the squeeze

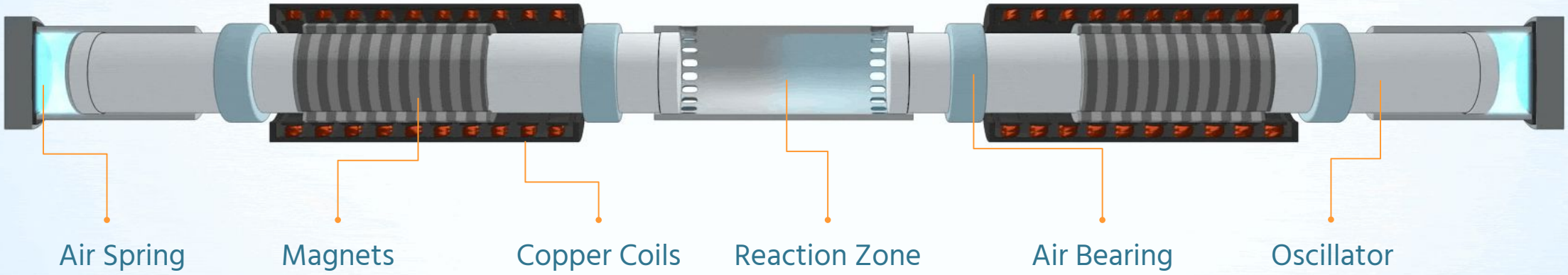
Precise, Variable Reaction Control Enables Fuel Flexibility







Power Electronics Complete the Picture



Fuel Flexible

Software control of every reaction means seamless change from NG, NH3, RNG, H2, and others

High Efficiency

High expansion ratios yield high efficiency converting fuel to electricity

Flameless

No spark or flame means low reaction temperatures and low emissions

The Mainspring Linear Generator

Any Size

Modularly scale like BES from behind-the-meter to grid-connected projects; ~20 MW in a football field

Any Load

Ramp as needed with renewables or run baseload when they aren't there

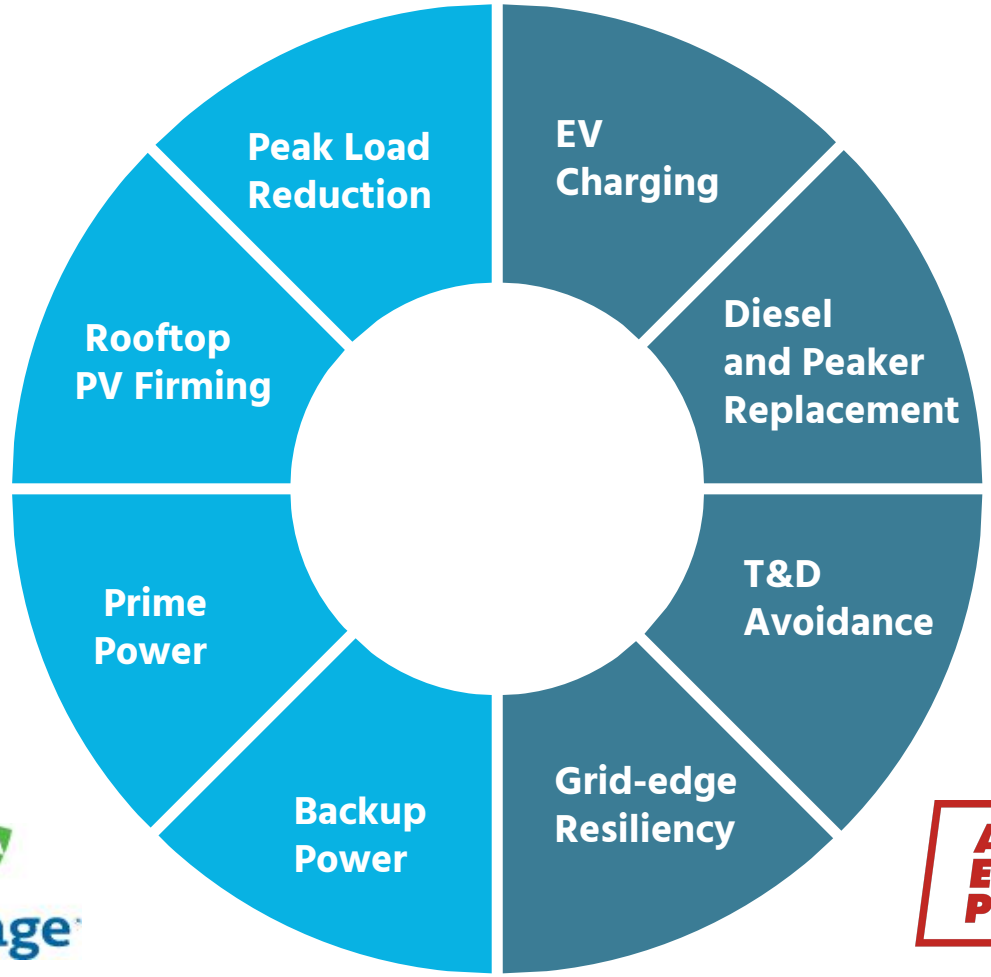
Anywhere

Mobile, easy to permit and install. Standard interconnection.

Clean, Firm Power For a Broad Range of Solutions

Commercial & Industrial

Utility & Grid Infrastructure



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Questions?

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