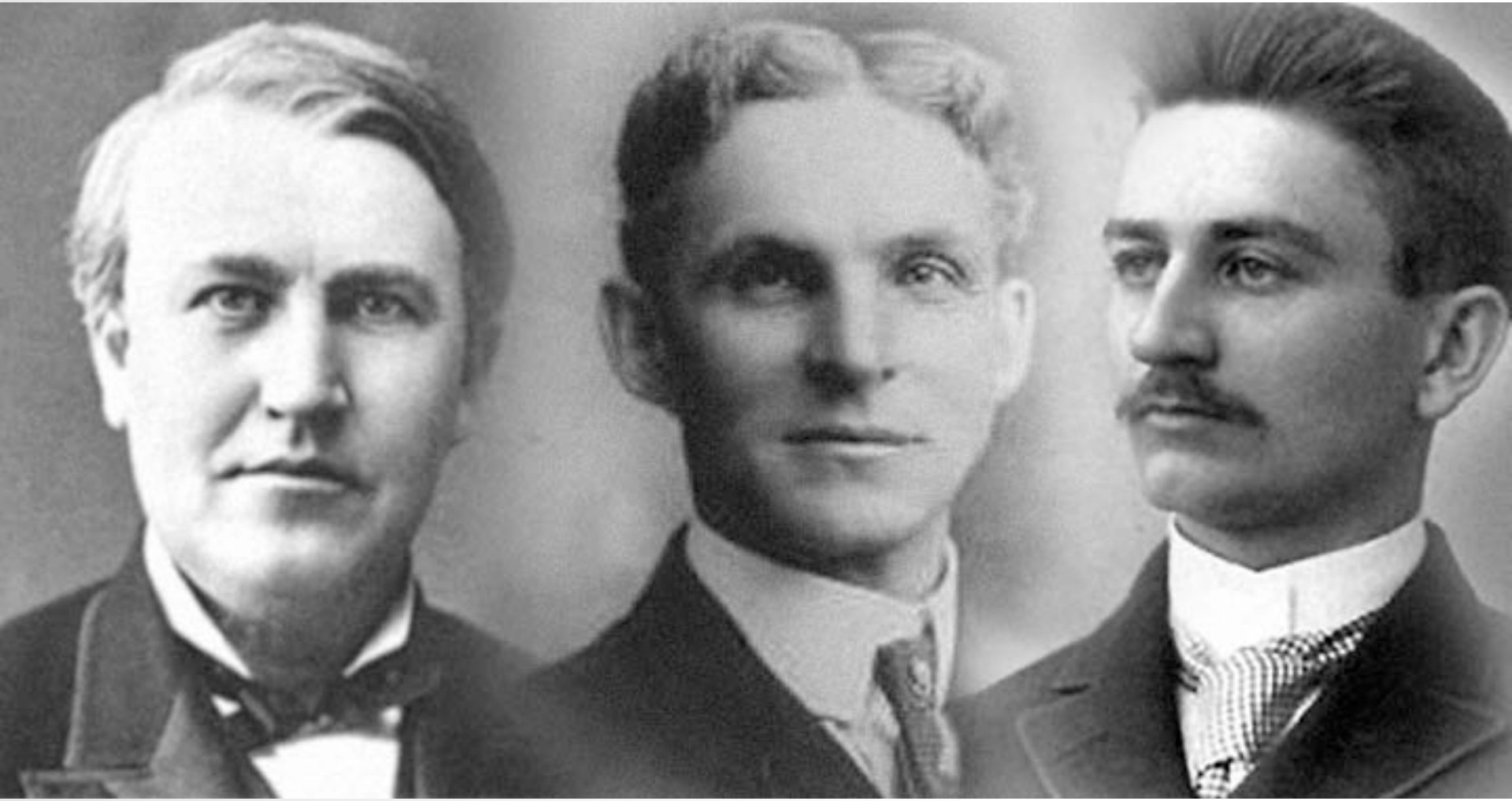
IEEE
Super Session General Meeting

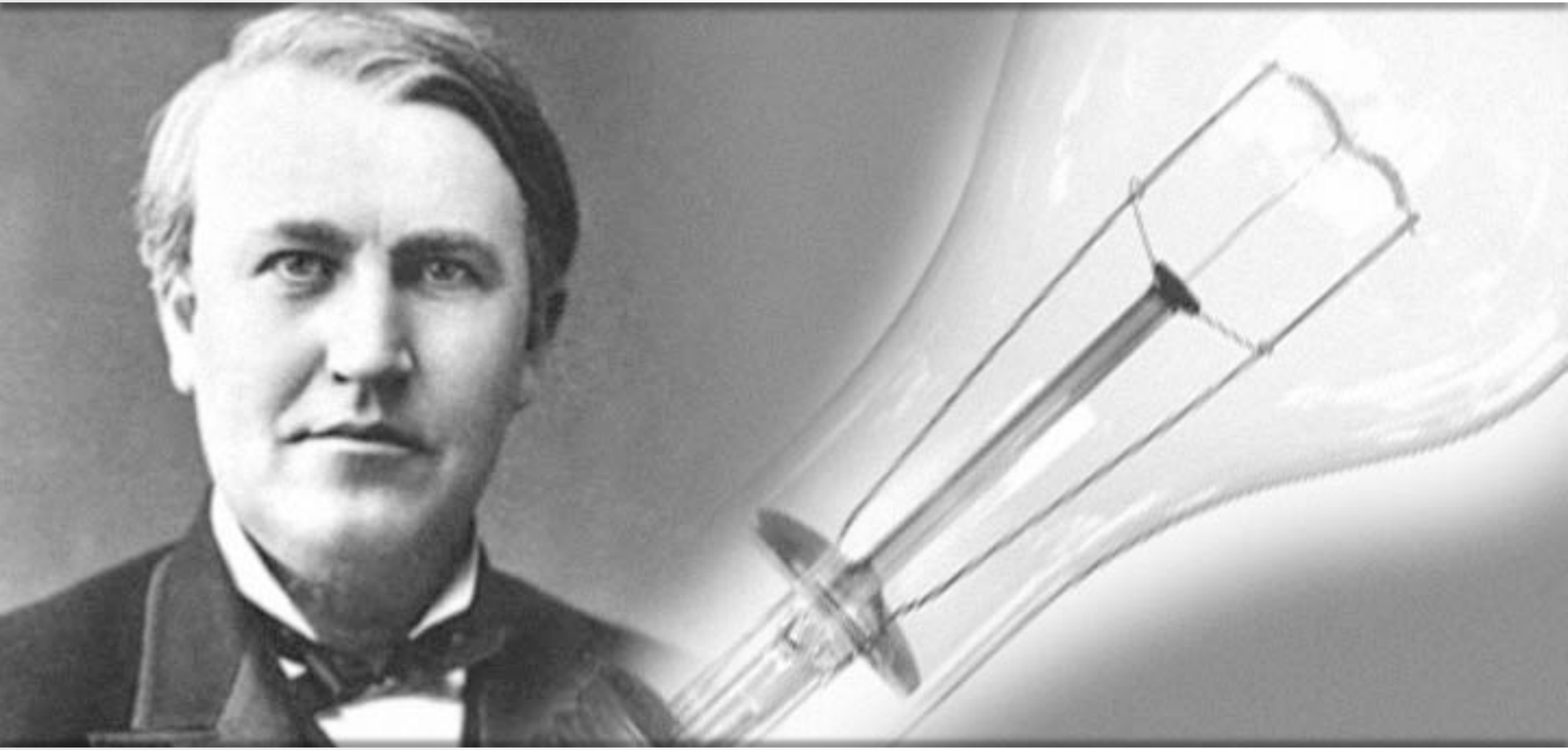
Enabling Solutions to a Low-Carbon Economy



What would Tom, Henry and Herbert do?

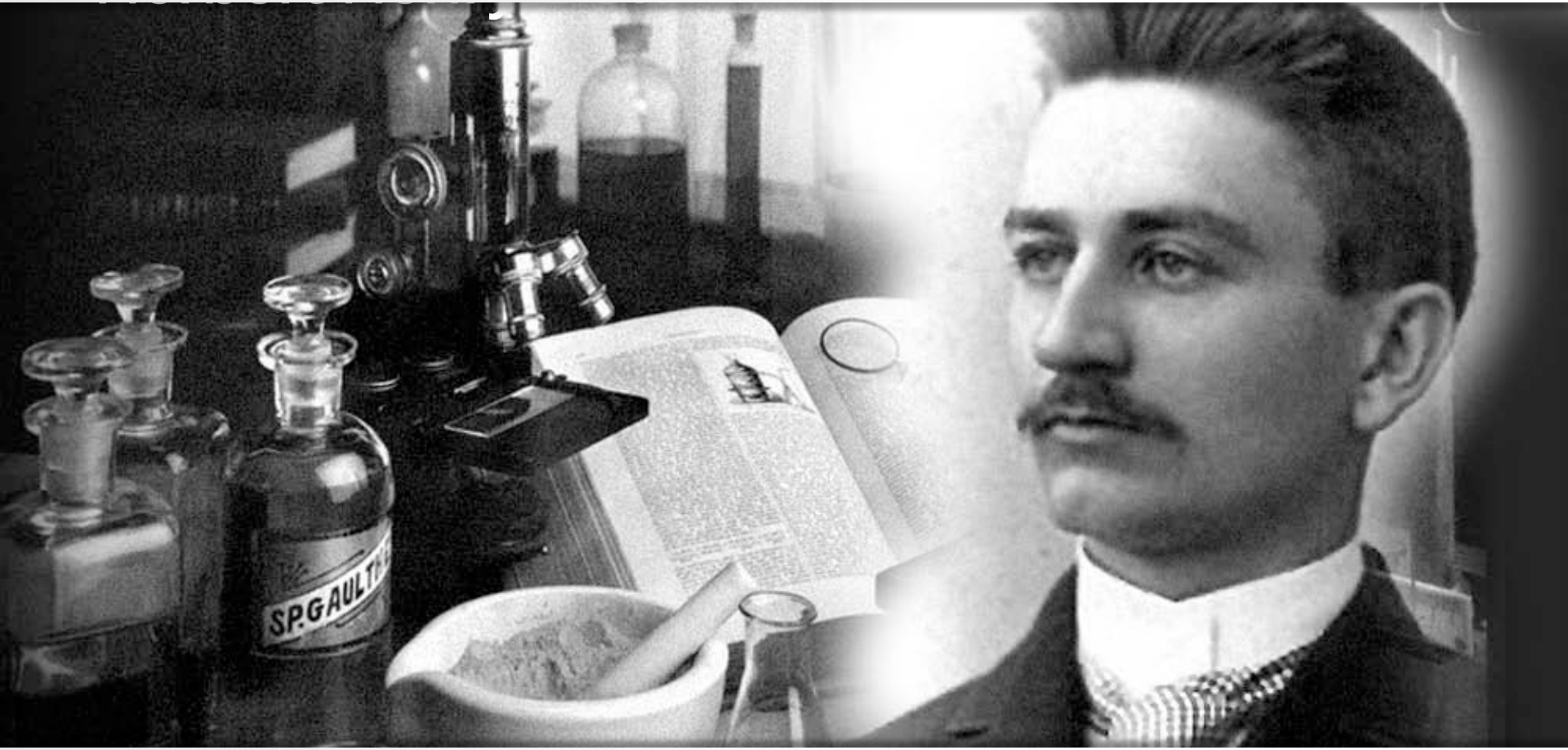
“The horse is here to stay but the automobile is *only a novelty — a fad*.”

Michigan Savings Bank President advising
*Henry Ford’s lawyer **NOT** to invest in the Ford Motor Co., 1903*



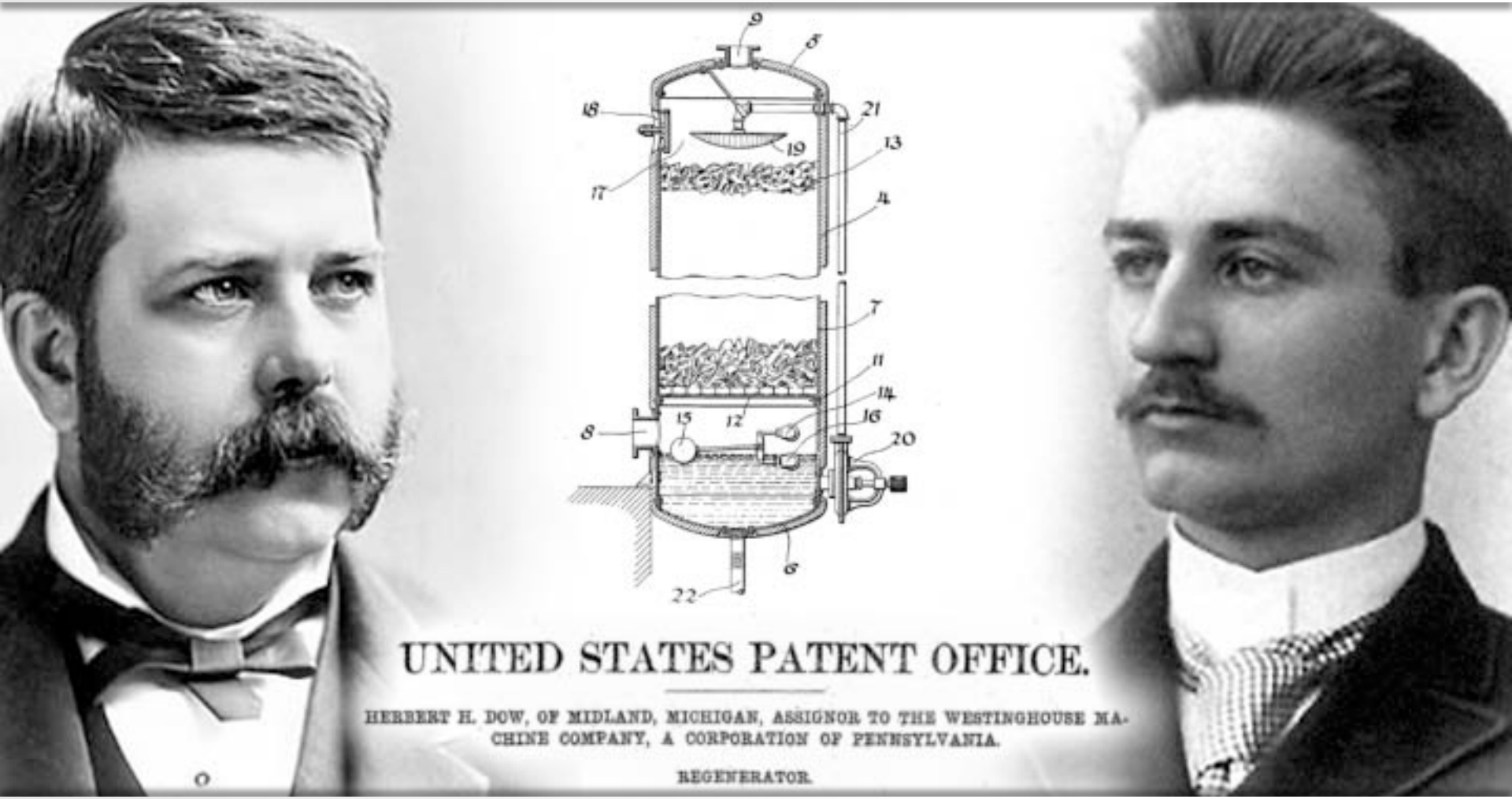
“It felt great, for every time, *I learned a way NOT to create the light bulb*.”

Thomas Edison… after 9,000 attempts



“I can find 100 men who will tell me it cannot work; *find me one who will make it work*.”

Herbert H. Dow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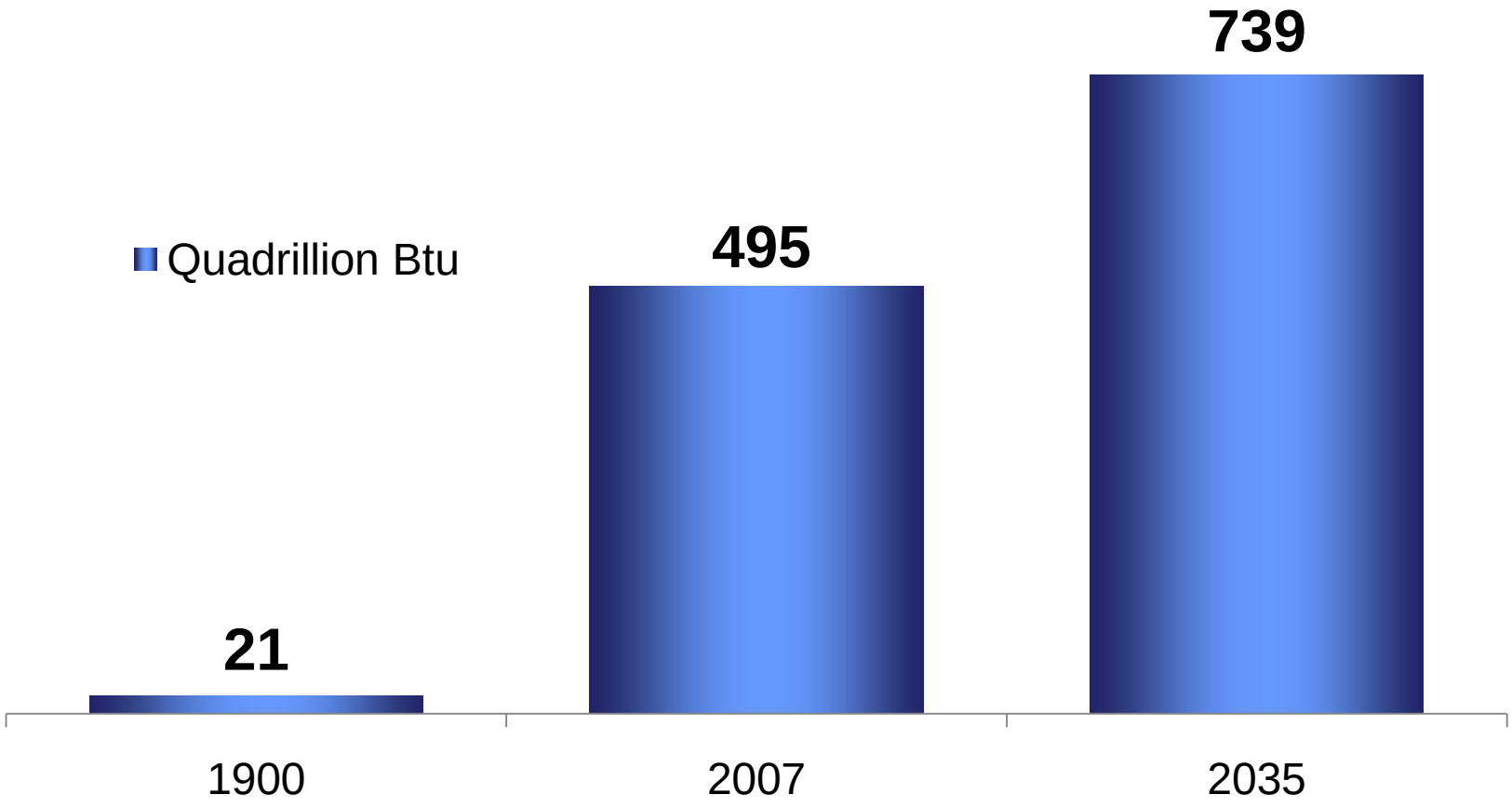
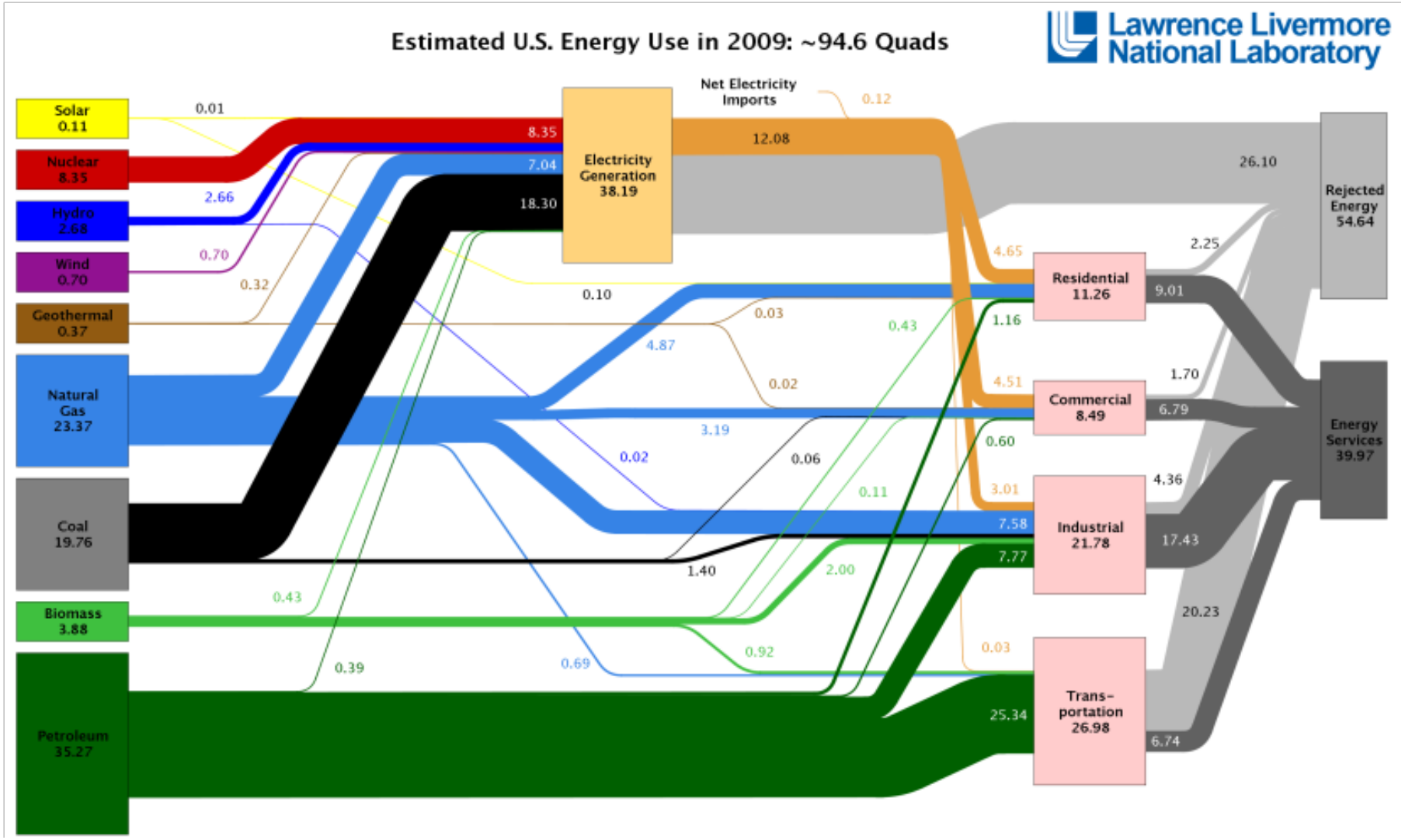
UNITED STATES PATENT OFFICE.
HERBERT H. DOW, OF MIDLAND, MICHIGAN, ASSIGNOR TO THE WESTINGHOUSE MACHINE COMPANY, A CORPORATION OF PENNSYLVANIA.
REGENERATOR.

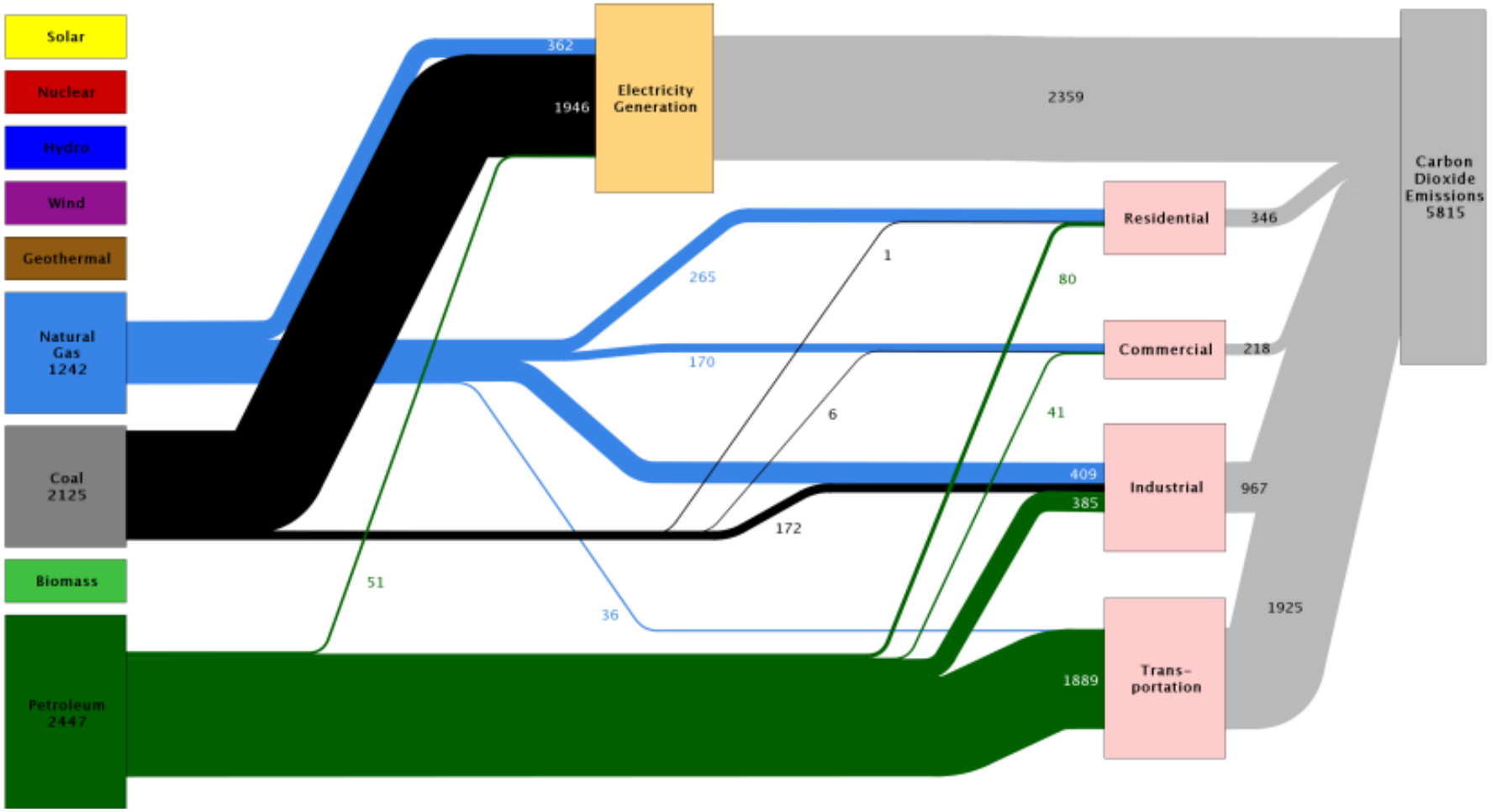
Growing Demand for Energy



Sources: Alte Energy Action & Energy Information Agency


Estimated U.S. Energy Use in 2009: ~94.6 Quads
Lawrence Livermore National Laboratory
Solar 0.11
Nuclear 8.35
Hydro 2.68
Wind 0.70
Geothermal 0.37
Natural Gas 23.37
Coal 19.76
Biomass 3.88
Petroleum 35.27
Net Electricity Imports
Electricity Generation 38.19
Residential 11.26
Commercial 8.49
Industrial 21.78
Trans-portation 26.98
Rejected Energy 54.64
Energy Services 39.97
0.01
8.35
7.04
18.30
2.66
0.70
0.32
0.10
0.12
12.08
4.87
0.03
0.02
3.19
0.02
0.06
0.43
0.11
1.40
2.00
0.43
0.39
0.69
0.92
4.65
4.51
3.01
0.03
1.16
0.60
7.58
7.77
25.34
26.10
2.25
9.01
1.70
6.79
4.36
17.43
20.23
6.74

Estimated U.S. Carbon Dioxide Emissions in 2008:
~5814 Million Metric Tons



The plan for a **sustainable energy future**

- **CONSERVE** through aggressive energy efficiency
- **OPTIMIZE** traditional energy supplies
- **ACCELERATE** development of alternatives
- **TRANSITION** to a low-carbon economy

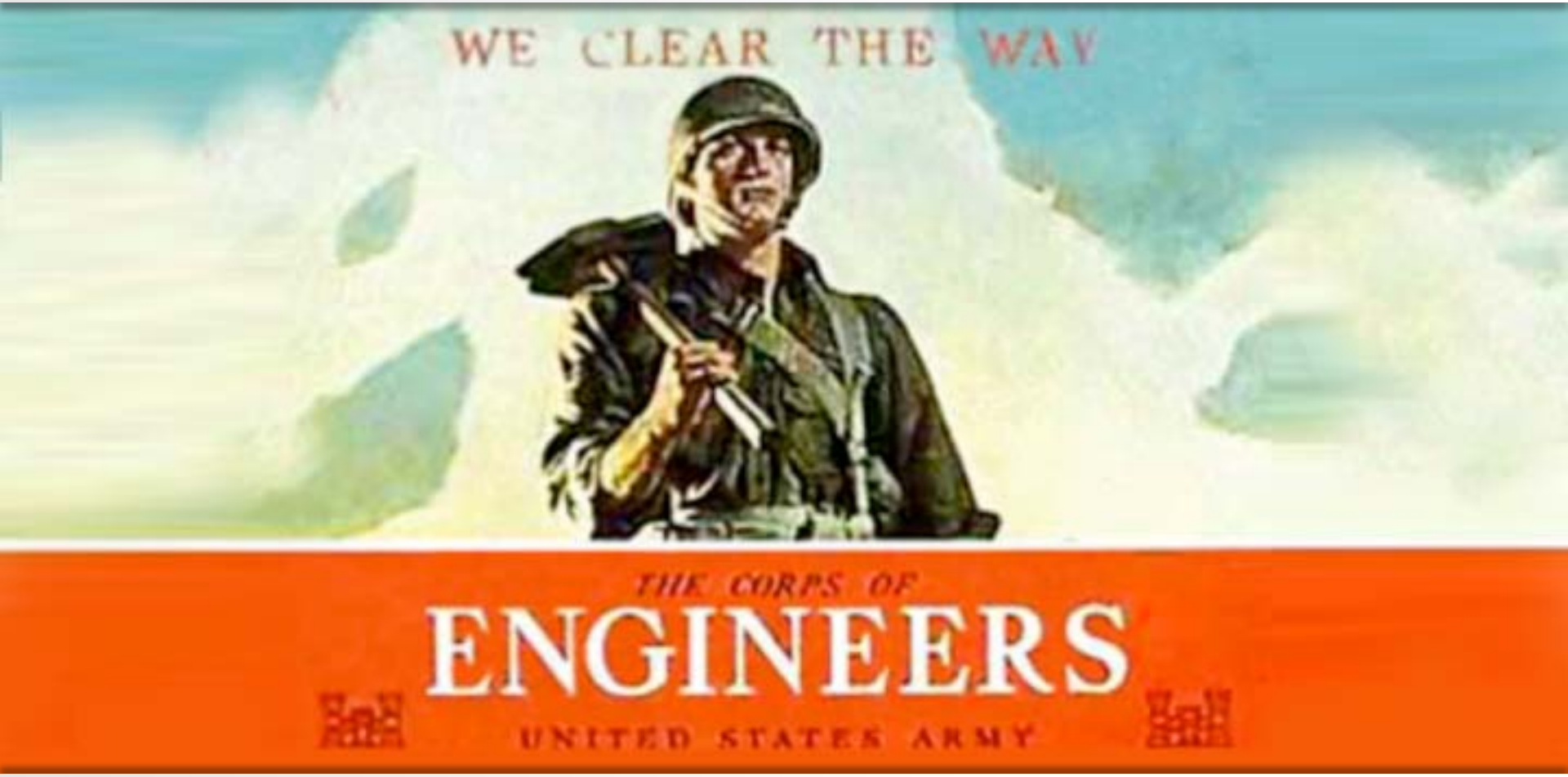
Ray McIntyre joins Thomas Edison, Henry Ford, Herbert Dow and 400 Americans in the National Inventors Hall of Fame

George Mitchell enables an energy and manufacturing renaissance in the US

Windmill Blades

Lithium-Ion Batteries

Building-Integrated Photovoltaics



“The difficult can be done immediately…
the *impossible* takes a little longer.”

US Army Corps of Engineers

Who will be the next Thomas Edison, Henry Ford or Herbert H. Dow?