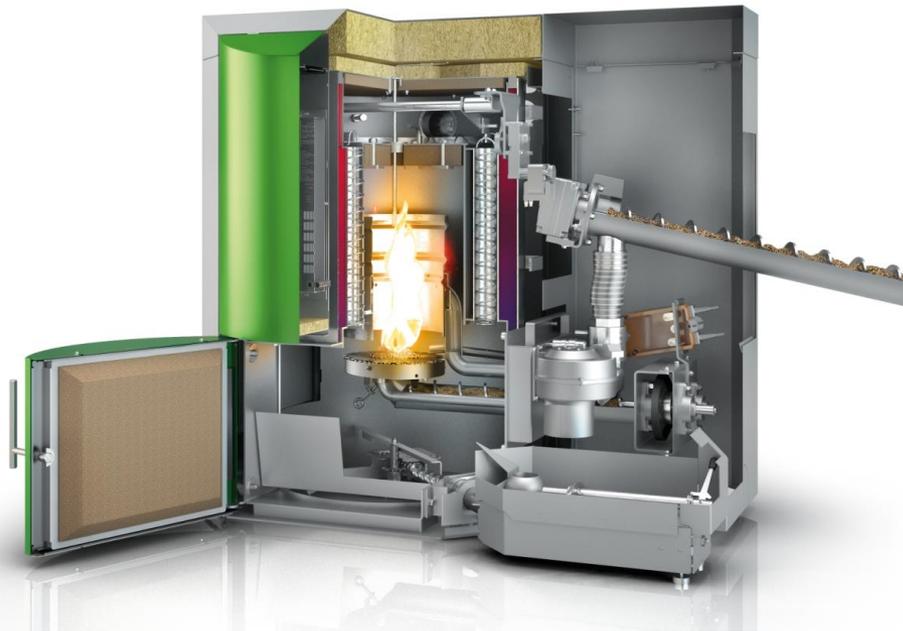


# Michigan Wood Energy Team

Kalamazoo Meeting, 9 January 2018

*Dr. Harry "Dutch" Dresser, Founding Director  
Maine Energy Systems*



# Three messages

1. The need for marketplace education won't end soon.

# Three messages

*Most people in your market have never known anything but fossil fuel or cordwood as a central heating system fuel. Primarily you are trying to get people to break old habits.*

# Three messages

1. The need for marketplace education won't end soon.
2. Collective will is essential for reasonable industry growth.

# These are the right sorts of people to have in agreement...

- Educators
- Transportation specialists
- Energy resource developers
- Boiler inspectors
- Environmental/climate specialists
- Labor/employment representatives
- Pellet manufacturers
- Pellet distributors
- Heating equipment distributors

# Three messages

1. The need for marketplace education won't end soon.
2. Collective will is essential for reasonable industry growth.
3. Attention to quality in the marketplace is critically important.

# Three messages



**No bad fuel**



**No bad equipment**

# Innovation



# 2007

- ~80% efficiency (HHV)
- ~40lb fuel consumption between burner cleanings (shutdown)
- Ash removal interval ~ 2 weeks
- Heat exchanger cleaning, manual



# 2009

- ~85-87% efficiency (HHV)
- No burner cleanings required
- Ash removal interval, 2 tons of fuel
- Heat exchanger cleaning, automatic



# Condensing technology

- ~91-92% efficiency (HHV)
- No burner cleanings required
- Ash removal interval, 2 tons of fuel
- Heat exchanger cleaning, automatic



# Economical, bag-filled boiler

- ~85-87% efficiency (HHV)
- No burner cleanings required
- Ash removal, manual
- Heat exchanger cleaning, easy
- Serves bag pellet market



# Forced hot air furnace

- ~85-87% efficiency (HHV)
- No burner cleanings required
- Ash removal, manual or automatic
- Heat exchanger cleaning, automatic
- Serves bag pellet market



# Pellematic\_e-max

Combined heat and power

- $\leq 60\text{kW}$  (205,000BTU) thermal output
- $\leq 5\text{kW}$  electrical energy output



# Staged systems



# Energy box



# Condens-e

Combined heat and power

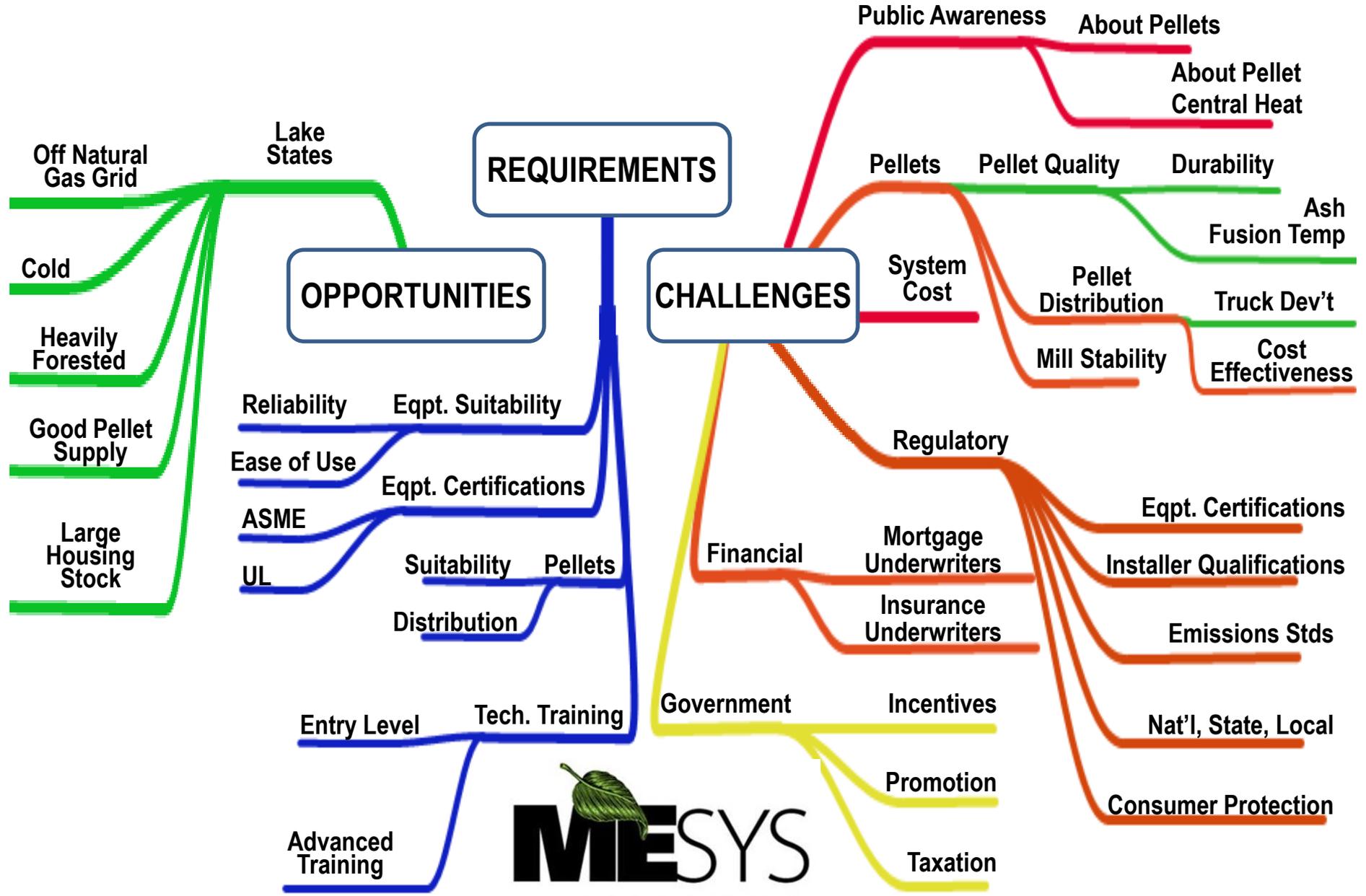
- $\leq 15\text{kW}$  (51,000BTU) thermal output
- $\geq 1\text{kW}$  electrical energy output



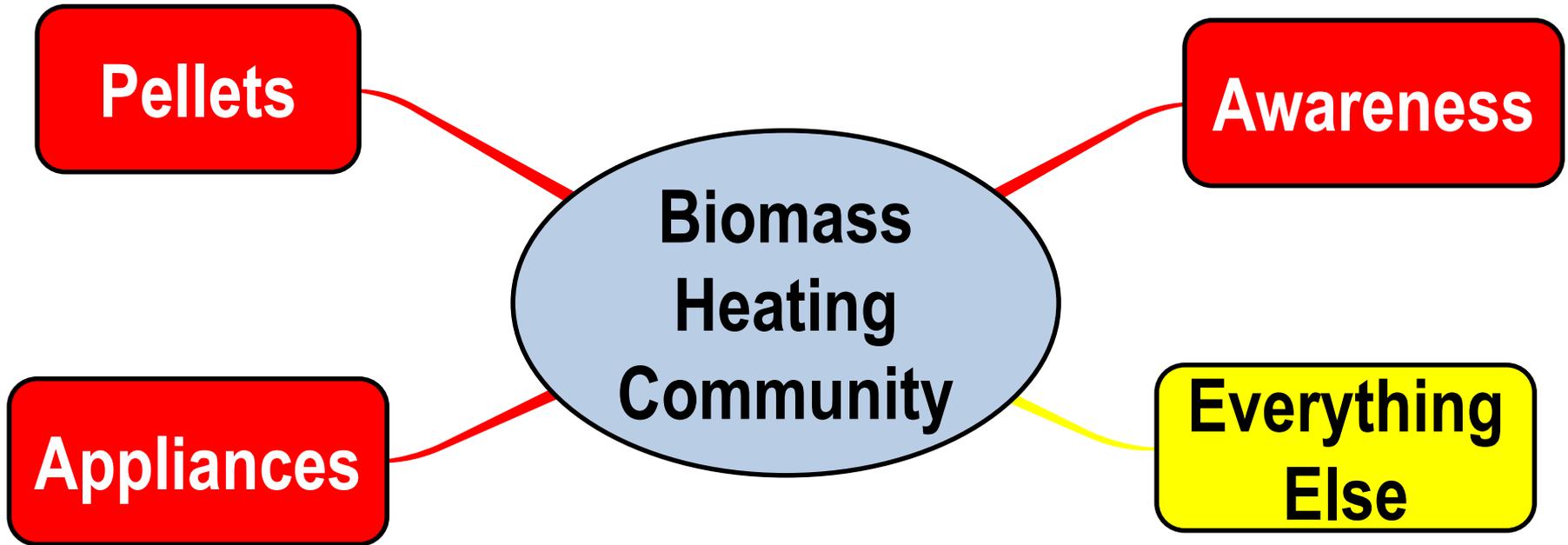
# Why support biomass as a renewable energy source?

1. It is locally produced, creating and sustaining jobs in your region.
2. It has significant carbon neutrality helping meet carbon reduction goals.
3. It helps retain all of the heating fuel money spent for the regional economy.

# Mindmap for Austrian Presentation



# The whole (abridged) puzzle



## Community values:

- **Economic:** many jobs across the spectrum
- **Environmental:** the best renewable energy resource for reduced life cycle carbon emissions

# Biomass community building



**Bulk Delivery**

**Pellets**

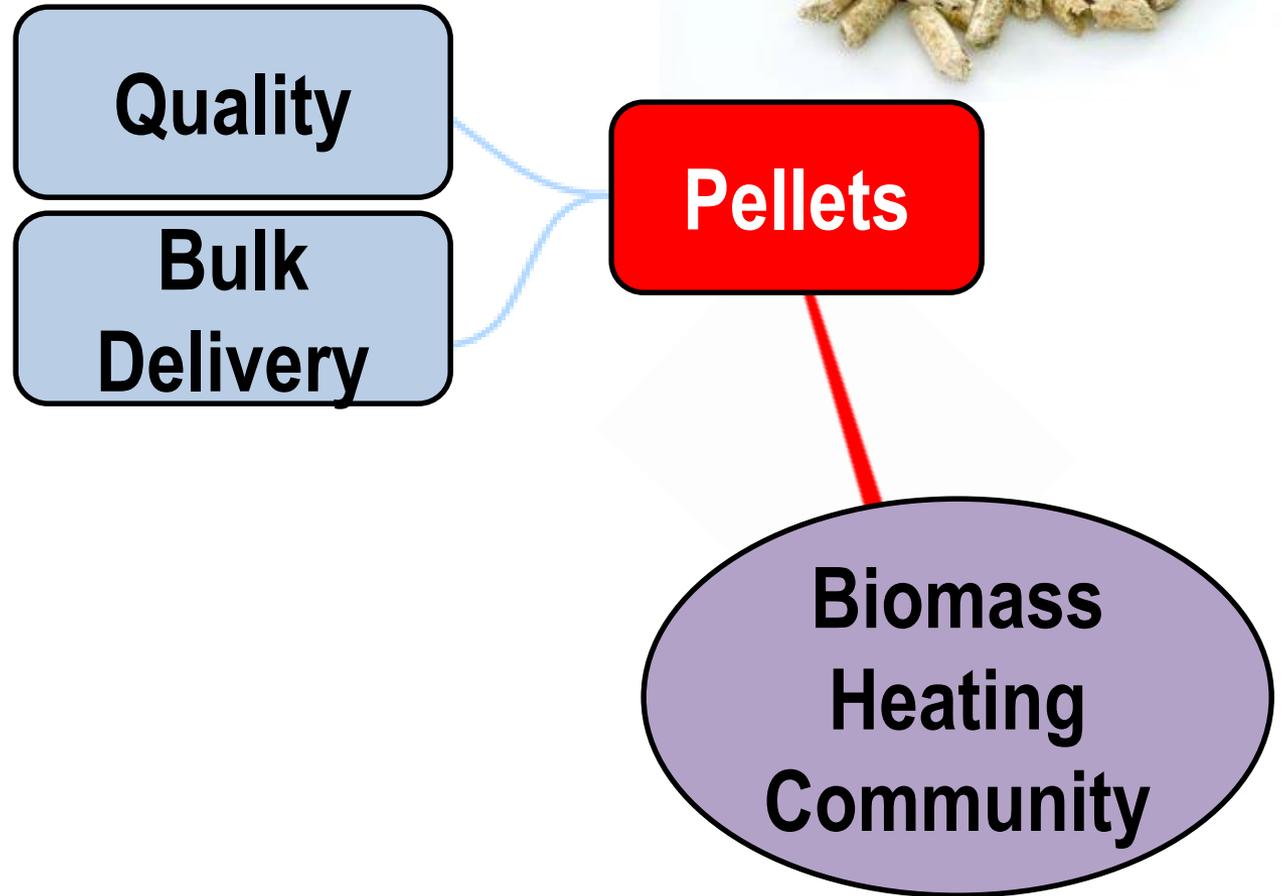
**Biomass Heating Community**



- Community values:**
- **Economic:** delivery jobs
  - **Environmental:** reduced life cycle carbon



# Biomass community building



# Reliable boilers



**Boilers**



**Appliances**

**Biomass  
Heating  
Community**

## Community values:

- **Economic:** fabrication, sales, installation jobs
- **Environmental:** reduced life cycle carbon

# Reliable furnaces



Boilers

Furnaces

Appliances

Biomass  
Heating  
Community



## Community values:

- **Economic:** fabrication, installation, sales jobs
- **Environmental:** reduced life cycle carbon, reduced electricity consumption

# Public awareness



Biomass Heating Community

Appliances

Equipment Attributes

### Community values:

- Economic: lower heating costs
- Environmental: reduced emissions

# Public awareness



**Awareness**

**Biomass  
Heating  
Community**

**Equipment  
Attributes**

**Environmental  
Impacts**

# Everything else

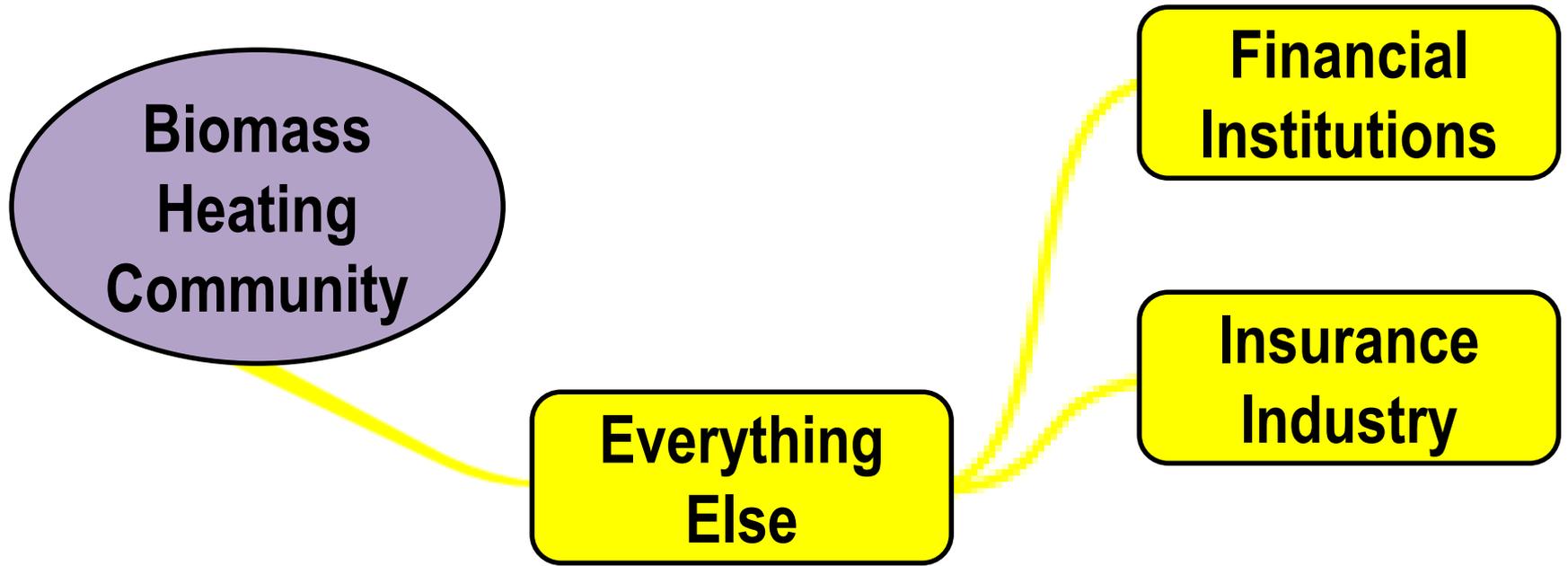
**Biomass  
Heating  
Community**



**Everything  
Else**

**Financial  
Institutions**

# Everything else



# Everything else

**Biomass  
Heating  
Community**

**Everything  
Else**

**Financial  
Institutions**

**Insurance  
Industry**

**Competing  
Industries**



# Everything else

Biomass  
Heating  
Community

Everything  
Else

Financial  
Institutions

Insurance  
Industry

Competing  
Industries

Regulating  
Agencies



# Three messages

1. The need for marketplace education won't end soon.
2. Collective will is essential for reasonable industry growth.
3. Attention to quality in the marketplace is critically important.

# Michigan Wood Energy Team

## Kalamazoo Meeting

*Dr. Harry “Dutch” Dresser, Maine Energy Systems*

Thank you for your attention