



QUESTIONS OF SCALE: BIOMASS ENERGY IN THE LANDSCAPE

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**California Ad-Hoc Forest
Biomass Working Group**

May 20th, 2020



OUTLINE

- About Wisewood Energy
- Questions of Scale
- So What?
- What Next?

ABOUT WISEWOOD ENERGY

- **Design/Build:** Biomass energy and processing installations including complete system Engineering, Procurement and Construction (EPC)
- **Project Development and Technical Consulting:** Feasibility assessments, conceptual design, project planning, project finance, fuel supply contracts, third-party owned energy generation assets
- **Clientele:** Local Government, Tribes, Educational Institutions, Commerce and Industry
- **Territory:** OR, CA, WA, AK, ID, MT, CO

Our Mission

We outfit communities with state-of-the-art biomass energy systems that make local economies more resilient, stabilize energy costs and restore forest ecosystems.

**Technology in Service of
Community and Environment**

Ketchikan International Airport

500MBH Pellet Boiler in Ketchikan, Alaska



Health & Human Services Center

400kW-th, 35kW-e in Plumas County, California



Pellet Mill - Oregon

64,000 finished tons/yr



IN THE BEGINNING...

“The great hope”

Bioenergy in Eastern Oregon and its implications for dry forest restoration

Meagan Louise Nuss,
M.S. Candidate

Thesis Defense
March 6, 2014

Major Professor: John C. Bliss
Forest Ecosystems and Society
College of Forestry, Oregon State University

Oregon State
UNIVERSITY

The “Great Hope”: Bioenergy in
Eastern Oregon and Its Implications
for Dry Forest Restoration

by
Meagan Louise Nuss

A THESIS

submitted to

Oregon State University



California Ad-Hoc Forest Working Group
QUESTIONS OF SCALE

FACTORS OF ADOPTION

1. **Available Supply:** Is raw material sustainably available?

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FACTORS OF ADOPTION

SCALE



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graph LR; A[SCALE] --> B[1. Available Supply: Is raw material sustainably available?]; A --> C[2. Social Acceptance: Will the project be overcome by pushback?]; A --> D[3. Financing: Is it economical?]; A --> E[4. Forest Sector: Do supply chains exist?];
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Becker *et al.* (2009a) define appropriately scaled processing as optimizing "the size of the facility with the volume of biomass sustainably available within an economically defined region" (p.21)

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Becker *et al.* (2009a) describe several instances in which small-scale or thermal biomass utilization applications have been pursued because prior large-scale ambitions met with challenges. They also note that strong arguments for large-scale bioenergy remain, and that some suggest small-scale bioenergy is potentially a stepping stone to larger applications in the future.



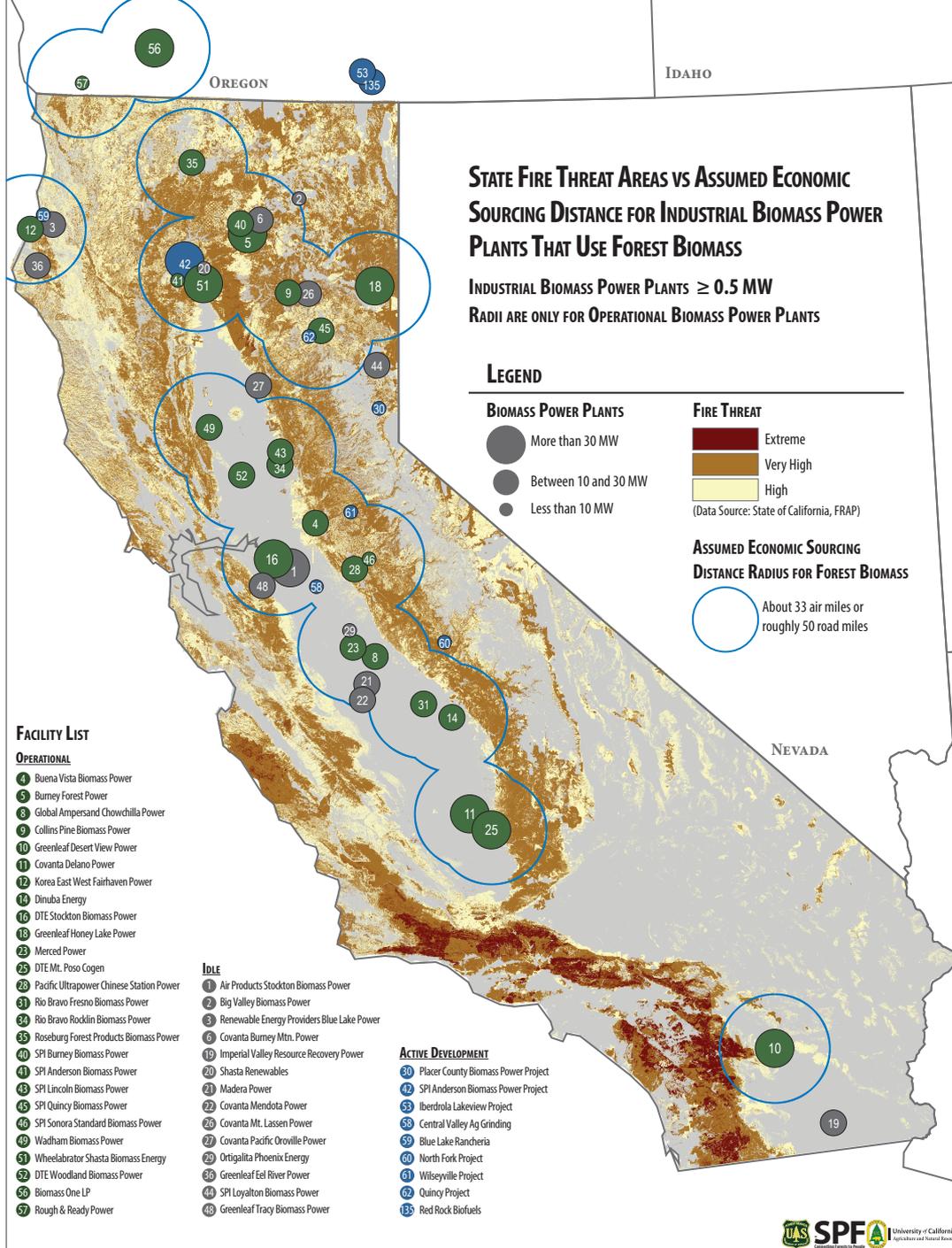
California Ad-Hoc Forest Working Group **SO WHAT?**







STOP



STATE FIRE THREAT AREAS VS ASSUMED ECONOMIC SOURCING DISTANCE FOR INDUSTRIAL BIOMASS POWER PLANTS THAT USE FOREST BIOMASS

INDUSTRIAL BIOMASS POWER PLANTS ≥ 0.5 MW
 RADII ARE ONLY FOR OPERATIONAL BIOMASS POWER PLANTS

LEGEND

BIOMASS POWER PLANTS	FIRE THREAT
● More than 30 MW	■ Extreme
● Between 10 and 30 MW	■ Very High
● Less than 10 MW	■ High
	(Data Source: State of California, FRAP)
	ASSUMED ECONOMIC SOURCING DISTANCE RADIUS FOR FOREST BIOMASS
	○ About 33 air miles or roughly 50 road miles

FACILITY LIST

OPERATIONAL

- 4 Buena Vista Biomass Power
- 5 Burney Forest Power
- 8 Global Ampersand Chowchilla Power
- 9 Collins Pine Biomass Power
- 10 Greenleaf Desert View Power
- 11 Covanta Delano Power
- 12 Korea East West Fairhaven Power
- 13 Dinuba Energy
- 15 DTE Stockton Biomass Power
- 16 Greenleaf Honey Lake Power
- 23 Merced Power
- 25 DTE Mt. Poso Cogen
- 28 Pacific Ultrapower Chinese Station Power
- 31 Rio Bravo Fresno Biomass Power
- 32 Rio Bravo Rocklin Biomass Power
- 35 Roseburg Forest Products Biomass Power
- 40 SPI Burney Biomass Power
- 41 SPI Anderson Biomass Power
- 43 SPI Lincoln Biomass Power
- 45 SPI Quincy Biomass Power
- 46 SPI Sonora Standard Biomass Power
- 47 Wadhams Biomass Power
- 51 Wheelabrator Shasta Biomass Energy
- 52 DTE Woodland Biomass Power
- 56 Biomass One LP
- 57 Rough & Ready Power

IDLE

- 1 Air Products Stockton Biomass Power
- 2 Big Valley Biomass Power
- 3 Renewable Energy Providers Blue Lake Power
- 6 Covanta Burney Mtn. Power
- 14 Imperial Valley Resource Recovery Power
- 20 Shasta Renewables
- 21 Madera Power
- 22 Covanta Mendota Power
- 26 Covanta Mt. Lassen Power
- 27 Covanta Pacific Oroville Power
- 29 Ortilgalita Phoenix Energy
- 30 Greenleaf Eel River Power
- 44 SPI Loyaltan Biomass Power
- 48 Greenleaf Tracy Biomass Power

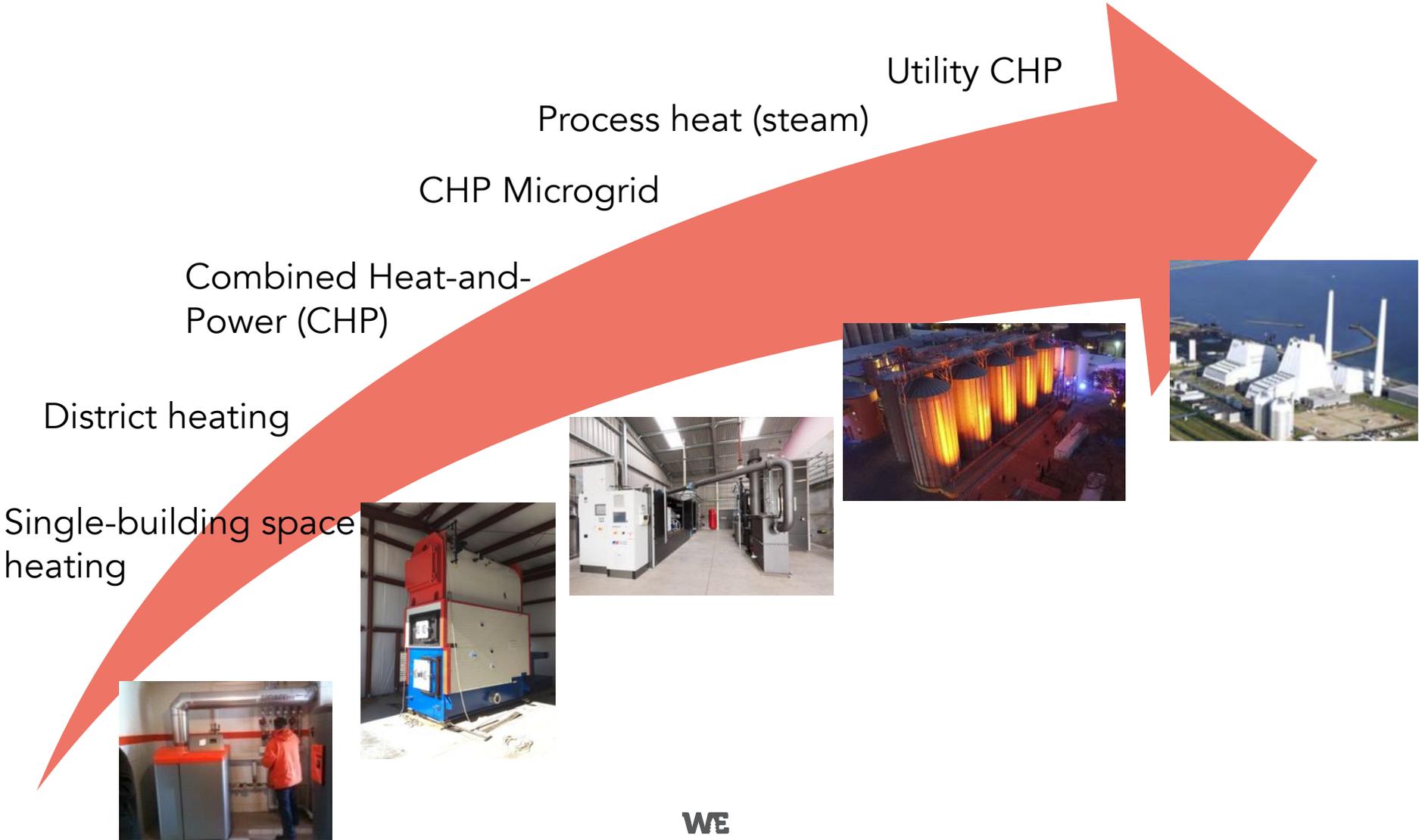
ACTIVE DEVELOPMENT

- 30 Placer County Biomass Power Project
- 42 SPI Anderson Biomass Power Project
- 53 Iberdrola Lakeview Project
- 58 Central Valley Ag Grinding
- 59 Blue Lake Rancheria
- 60 North Fork Project
- 61 Wilseyville Project
- 62 Quincy Project
- 135 Red Rock Biofuels



California Ad-Hoc Forest Working Group
WHAT NEXT?

BIOMASS ENERGY TECHNOLOGIES



Rural Forested Community, Anywhere CA...

Small to Medium wood energy opportunities across the state!



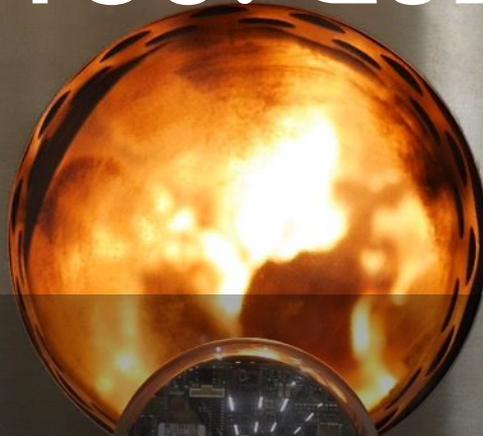
KEY QUESTIONS

- **What is the scale of your local underutilized wood source? What type of wood fuel is consistently available?**
- **What scale of utilization is acceptable to key stakeholders?**
- **Where are your largest energy loads? Do power incentives exist for biomass?**
- **Where is new construction happening?**
- **Who are your local entrepreneurs and your project champions?**



WISEWOOD ENERGY

THANK YOU! QUESTIONS?



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