

PROBLEM STATEMENT

An abundance of biomaterial exists in the region as a byproduct of industrial lumber production, this material has little value and is currently being used primarily for steam generation.

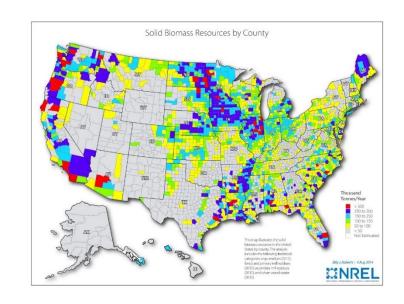
MISSION STATEMENT

Our team's mission is to develop and prototype a model of a scalable, practical retrofit for modern, industrial boilers that will produce biochar for sale and heat energy. This design must account for multiple variables and allow control of input and output flow rates amongst other factors.



BIOCHAR

- Rich in fixed carbon
- Enhanced surface area caused by micro and macro pores that easily absorb and maintain moisture and nutrients
- Can be used as a filtering media to absorb contaminants in rainwater and storm water runoff.
- 1,750,000 tons of waste biomass were produced in area surrounding Moscow (150 mi. radius).



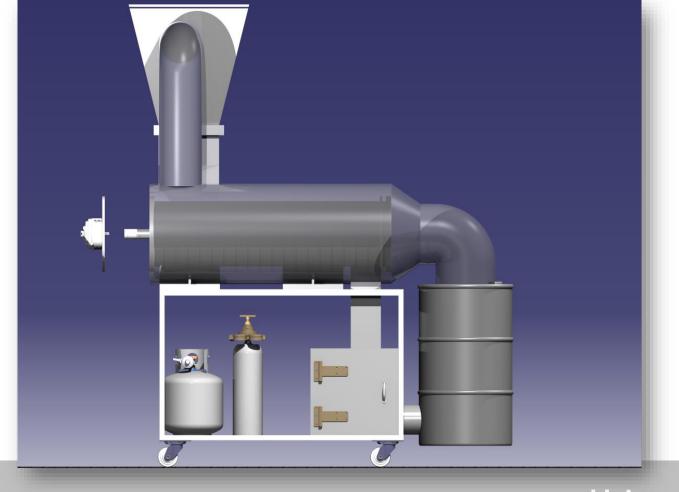


 $https://www.nrel.gov/gis/images/biomass_2014/national_biomass_solid_total_2014-01.jpg$

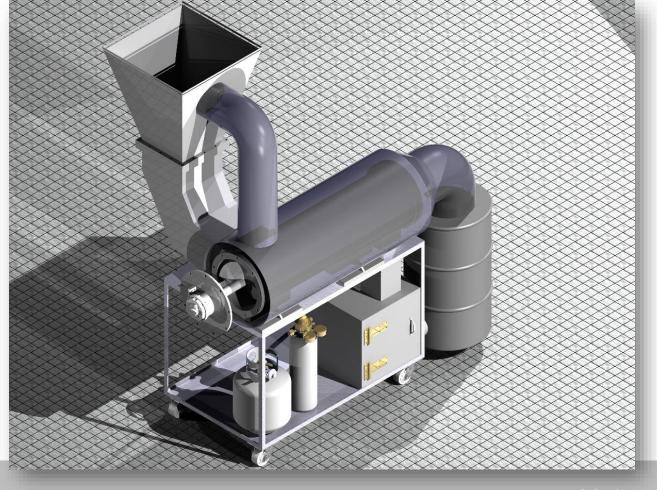
NEEDS AND CONSTRAINTS

- Continuous process
- Easily integrated to a boiler system
- Scalable industrial design
- Energy efficient design
- Dynamic control system
- Heat exchanger













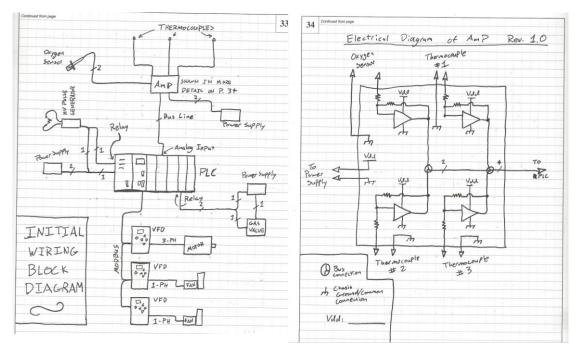


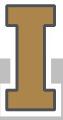
BUDGET

Budget Template															
11/28/17	Last Update	ed		Toda	у										
	2017					2018						Item			
Expense Items	Sept	Oc	t	Nov	Dec	Jan	Feb	Mar	Apr	May		Total			
Equipment															
Motor				\$ 91							\$	91			
Gear box		\$ 2	200								\$	200			
Propane		\$	30		1						\$	30			
Nitrogen		\$	40		1						\$	40			
Tubing		\$	20		1						\$	20			
Regulator		\$	20		1						\$	20			
Heat source				\$ 75							\$	75			
Sheet metal				\$ 300							\$	300			
											\$	-			
Oxygen Sensor				\$ 20							\$	20			
Thermocouples				\$ 78							\$	78			
					1						\$	-			
					1						\$	-			
					1						\$	-			
					1						\$	-			
											\$	-			
Shipping										\$ 200	\$	200			
													Subtotal	\$	1,074
Graduate Student Support														F	
Shop Overhead															
University Overhead (5%)															
,										Totals	Ś	1,074	\$ 2,000	Ś	926
						-	-			Totals	2	1,074		-	
													Budget	E	xce



ELECTRICAL BLOCK DIAGRAMS





PROJECT SCHEDULE

2			January	У		Februa	ary		March				
3		8-Jan	15-Jan	22-Jan	29-Jan	5-Feb	12-Feb	19-Feb	26-Feb	5-Mar	12-Mar	19-Mar	26-Mar
4													
5	Project Learning												
6	Client meeting												
7	Idea development												
8	Design process												
9	Snapshot Day 1												
10	Modelling												
11	Idaho Pitch Competition												
12	Final designs												
13	Present designs to client (for approval)												
14	Snapshot Day 2												
15	Building/production												
16	Wiki Page Development												
17	Logbooks												
18	Portfolio												
19	Team Member Citizenship												
20	Detailed Design review												
21	Sanpshot Day 3												
22	Rework												
23	Expo												
24	Auger Built												
25	Hopper Attached												
26	Boiler system installed												

Key Deadlines:

Building begins: 10- Jan Auger Built: 29- Jan

Hopper built: 19- Feb

Boiler attached: 19- Mar

Rework starts: 26 Mar

University of Idaho