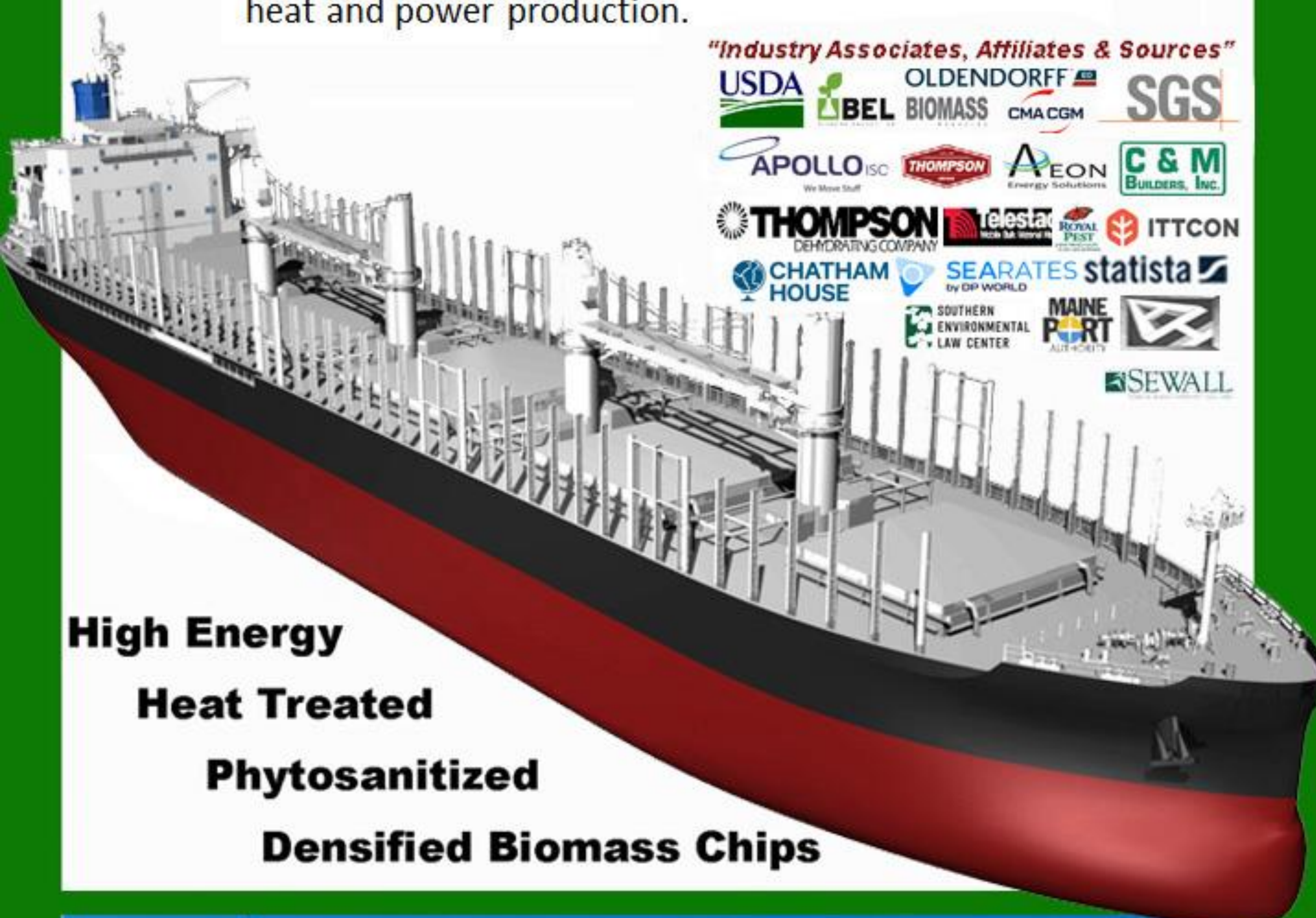
E = MC³ ©
Energy = Maine Chips³ (cubed)

TOWARD CARBON NEUTRALITY

Transforming Traditional CHP Fiber Supply

E=MC³ as a renewable-energy fiber, is a perfect substitute commodity, and seamless complimentary alternative to the use of wood pellets for combined heat and power production.

"Industry Associates, Affiliates & Sources"



High Energy

Heat Treated

Phytosanitized

Densified Biomass Chips

$E=MC^3$ maximizes greenhouse gas reduction and moves toward verifiable carbon-neutrality:

The perfect substitute for wood pellets.

Exponential expansion of the wood pellet industry threatens global climate stability. To reverse the imminent catastrophic damages we must recognize the issues as follows:

Traditional Wood Pellet Consumption Burden on the Environment

Wood pellet consumption in the European Union in 2019, as measured in million metric tonnes (MMt), reveals that the UK alone consumed 9.2 MMt, followed by Italy at 3.4 MMt, Denmark at 3 MMt, Germany at 2.3 MMt, and France at 1.8 MMt – for a total of 19.7 MMt per year. [1] The report predicts wood pellet demand will expand to 30.8 MMt in 2020.[2] Research reveals annual "global production of wood pellets would increase from 38.9 to 120 MMt between 2019 and 2050."[3]

The Southern Environmental Law Center reports that "Drax imported over 4.4 million tonnes of wood pellets from the southeastern U.S. and this equates to over 32,500 hectares (80,309 acres) of forests that were harvested in 2018 alone to supply wood pellets."[4] This conversion of 4.4 MMt equal to 80,309 acres means that every 1 MMt of wood pellets requires 18,252 acres of timber harvest. By 2050 the global annual consumption will reach 120 MMT/year and require 2.10 million acres of forest harvest per year.

The production of wood pellets requires approximately 2.4 times the annual pellet production volume. One million metric tonnes of wood pellets will require 2.4 million US short tons of raw fiber after harvesting, debarking, chipping and size classification, and drying shrinkage during the extensive heating process. By 2050 the total deforestation of forests in terms of material tonnage will be approximately 288 million tons of raw fiber. This is an entirely unsustainable volume of raw fiber and an overall stripping of 2.1 million acres of forest per year – or roughly 32% of the entire land mass of Massachusetts – at this rate it would take 3-years to clear-cut the entire state.

"Emissions from US-sourced biomass burnt in the UK are projected to rise to 17 million–20 million tonnes of CO_2 a year by 2025."[5] "The most negative impacts on carbon concentrations in the atmosphere is derived from harvesting … natural forests."[6] "Where whole trees are harvested and used for energy, not only is the stored carbon in the tree released to the atmosphere immediately, but the tree's future carbon sequestration capacity is lost.)[7]

E=MC³ ©

Transforms Traditional Supply Processes Toward True Carbon Neutrality Goals

Heat Treated – High Energy Phytosanitized
High Density CHP Biomass Chips

The production of E=MC³©

Utilizes **ZERO** forest harvesting

Processes only forest residue and wastes

Phytosanitized chips are 100% Bark Free

Heat treatment - processing reduces raw material by 20%

1 MMt exported = 1.2 M US Ton (residue/waste only)

Vessel Stowage exceeds wood pellet density stow.

The smallest impacts on the climate are derived of the use of residues and wastes from forest harvesting or forest industries, that imply no additional harvesting, and would otherwise be burnt as waste or left to decay, thereby releasing carbon to the atmosphere in any case. [8} E=MC³ © Utilizes only that waste and residue left over from merchantable harvests for timber and lumber production such as Mass Timber, Cross Laminated Timber (CLT), furniture manufacturing and as waste from harvests necessary for paper manufacturing.

No raw material is derived from cutting, none is left in forest to decay, and all waste is a byproduct of a forest harvest use in a production of a fiber or timber product that will continue to sequester its carbon for the life-cycle of that product – in construction that can be 50 to 75 years.

Environmental Obligations Demand Changes:

Starting with Identification and Reduction of Carbon Emissions Threats

Reduce Threats to Global Environment

1.) End Clear-Cutting - Intrusive Forest Harvesting

2.) Fiber Origination – source only Residues and Wastes

3.) Curtail Carbon Intensive Trucking to Reduce GHG Emissions

4.) Transition to Rail Transport – GHG Emission Reduced 84%

5.) Centralize Fiber Aggregate, Classify, Process for Quality Assurance

6.) Exceed EU Import Mandates – Phytosanitation

7.) Densify for Effective, Efficient and Low Cost Material Handling

8.) Eliminate:

Costly Storage Buildings,
Chip-Pile Management,
Port Handling – Movement & Covering,
Inclement Weather – Climate Exposure;

9.) Ocean Freight cost Reduction exceed Wood Pellet Density/Stowage Value

10.) Financial Benefits from Acting Responsibly

11.) Replicate the Above.

Adherence Assures Meaningful Carbon Emission Reductions

$E = MC^3$ ©

1.) End Clear-Cutting - Intrusive Forest Harvesting

Intrusive Harvesting Impacts – EU

Based on 1 EU Company

In 2019 one EU company alone consumed roughly 9 MMt of wood pellets (or roughly 21.6 M-US tons of raw wood chip fiber per year). This requires active management and harvesting of 4,600 sq. miles of forests or 2.94 m acres Slightly smaller than the entire State of Connecticut.

"An estimated 4,600 square miles of forest are needed to feed the voracious Drax plant." [9] **Roughly 2.94 million acres annually - Roughly 8,066 acres a day to maintain operations. Replanted trees will take 50 Years to regrow. Despite the decarbonization claims, the CO_2 emitted from the Drax plant is far greater today than when coal fuel was burned.** [10]

Intrusive Harvesting Impacts US-SE

Based on 1 SE Based Company

US-SE region expected to export 13.6 MMt annually by 2030

At the time of this report in 2017 80,000 acres were being harvested annually.

By 2030 this will increase to 280,000 acres annually to keep up with demand.

"The use of wood and other biomass will increase at an average annual rate of 4.4 % from 2014 through 2040" [11]

Negative Perceptions – Damaging to Industry

Surprise! Greedy Green Energy Corporatists are Clear Felling Protected Forests for Biomass [12]

The Obvious Biomass Emissions Error [13]

A Trifecta of Green Lunacy: The law of unintended consequences kicks in [14]

Wood-burning power plants: Misguided climate change solution? [15]

Green Shock: Entire Forests Being Murdered to Produce Wood Pellet Biomass [16]

Hardwood forest cut down to feed Power plant, Channel 4 Dispatches claims [17]

Dangerous delusions: biomass is not a renewable energy source [18]

Negative Effects of Biomass [19]

The biomass industry should come clean about its environmental impact [20]

False [Bad] News Travels Farther, Faster Than The Truth, MIT Study Finds
https://www.wbur.org/commonhealth/2018/03/08/fake-news-twitter
Word of Mouth 7 Times Faster - Social Media 1,000 Times Faster

$E = MC^3$ ©

2.) Fiber Origination – source only Residues and Wastes


100% Debarked, fiber waste from **Paper Manufacturing** plants. Typically reduced to < 20% MC prior to arrival. Blended with other residues and wastes. Photos: *Apollo – Bucksport Mill*



Waste materials, 100% debarked, derived from **Regional Lumber Mills**. Shavings, wood chips, screened and sized for processing biomass. Photos: *Apollo & Maine Biomass Exports – Irving Mill*

Removing the smaller, weaker trees by **Thinning Forests** (left) produces a more natural and healthier stand (right) that will be more resilient to wildfire and insect infestations. Photos: *Glenn Kohler/DNR*

Major tree removal companies deliver tree trunks and branches to the aggregate yard for processing. Raw material is typically delivered free or at a nominal dipping fee paid to the yard. Photo: *MB Exports – Searsport Yard*

Residue generated by merchantable timber harvests. For every 1,000 cubic feet delivered to a mill, there is approximately 28 cubic feet of slash and logging residue created and left in forest. Residues would arrive on rail cars at about 75 Mt per car (replacing 2.5 truck loads over the road. Source: *U.S. Forest Service*

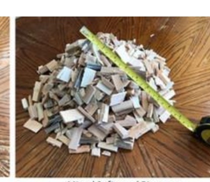

Red Pine


Eastern White Pine


Red Soruce


Balsam Fir


Eastern Hemlock


Mixed Softwood Biomass

Fiber chips produced from softwood residuals and wastes. Photos: *MB Exports – Searsport Yard*

Fiber Origination – **Residuals come from well managed and properly certified forests**

- Maine contains an estimated **17.6 million acres of forest land** and covers **89.1%** of the land area in the State. Most of the forest land, **95.3 %, is classified as timberland**, meaning that it **exceeds a minimum level of productivity** and is not legislatively reserved from timber harvesting.
- Forest land, in Maine there is an estimated **23.9 billion live trees** ≥1 in d.b.h.
- These trees have a total **above ground biomass** of **713.8 million tons** and, looking at trees ≥5 in d.b.h., a total net volume of 27.3 billion ft3 . The ratio of net growth to **removals is 1.4:1**.
- **Certificated Fiber: 1.55 M acres FSC**; **2.83 M acres SFI** and **3.26 M acres both FSC and SFI** = **7.64 M acres total**
- As a result of merchantable forest harvest – the **residual and waste** is **abundant.**
  https://www.fs.fed.us/nrs/pubs/ru/ru_fs160.pdf

Sustainability Statistics
Considering all Four (4) Mega Forest Regions

Certifications

Major Landowners Harvest Acreage

Certifications	Acres	Owners
FSC	1,548,319	11
SFI	2,831,237	7
FSC & SFI	3,257,579	1
	7,637,135	**19**

Every landowner has cutting plans, sustainability plans and works with licensed, certified Forester to define annual cuts and to oversee all required to supply fiber from the land through licensed logging companies.

Logging Contractors and Trucking Firms

Total	**86**	
Within 50 mi	53	62%
Beyond 50 mi	33	38%

5,000,000	US Tons Available
4,508,500	Metric Tons Available

E = MC³ ©

Fiber Statistics: Specifications – Classification & Testing

WOOD CHIPS - SOFTWOOD

Spruce/Pine/Fir – and Hemlock

Maine wood chips are produced from paper-quality, SPF fiber. Harvested from within a 17.7 million acre wood basket in the state of Maine. Maine fiber is chosen for its extremely high quality and designer suitability in the manufacture of paper and pulp, particleboard, MDF and wood pellets.

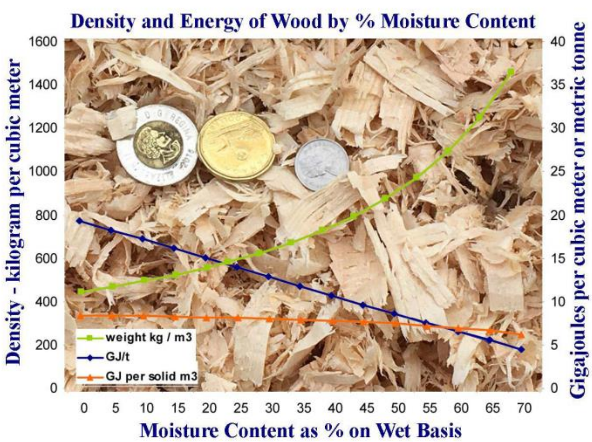
PROCESSED – VALUE ADDED

Maine softwood chips are harvested from base-cut trees, debarked, and chipped according to design specifications. They are screened and size-filtered to spec and finish as pristine softwood chips.

TYPICAL WOOD CHIP SPECIFICATIONS

Spruce/Pine/Fir – and Hemlock

Accepts:	.45 cm - 4.5 cm	90% Maximum
Overs:	4.5 cm	5% Maximum
Fines:	.45 cm	5% Maximum
Bark		< 1% Maximum



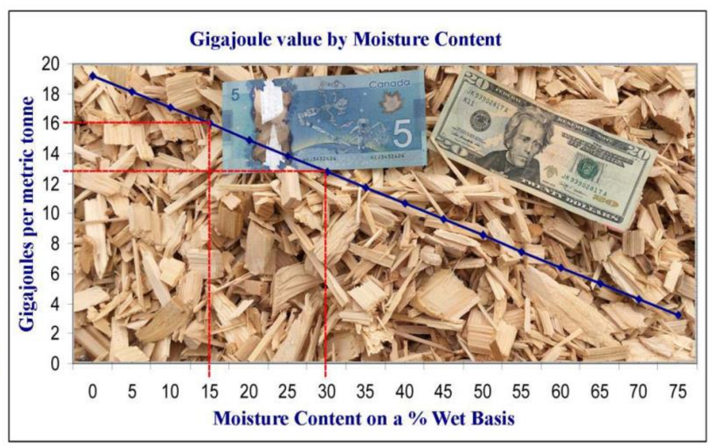
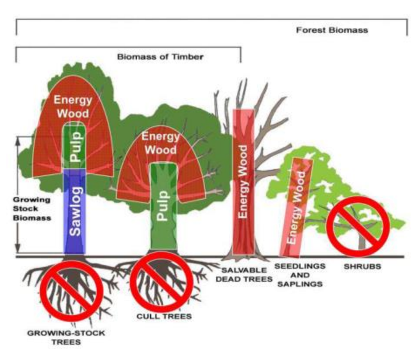


Table 1. Classification of 1 Woody biomass (EN 14961-1)[5]

1.1 Forest, plantation and other virgin wood	1.1.1 Whole trees without roots	1.1.1.1 Broadleaf
		1.1.1.2 Coniferous
		1.1.1.5 Blends and mixtures
	1.1.2 Whole trees with roots	1.1.2.1 Broadleaf
		1.1.2.2 Coniferous
		1.1.2.5 Blends and mixtures
	1.1.3 Stemwood	1.1.3.1 Broadleaf
		1.1.3.2 Coniferous
		1.1.3.3 Blends and mixtures
	1.1.4 Logging residues	1.1.4.3 Stored, Broadleaf
		1.1.4.4 Stored, Coniferous
		1.1.4.5 Blends and mixtures
	1.1.5 Stumps/roots	1.1.5.1 Broadleaf
		1.1.5.2 Coniferous
		1.1.5.5 Blends and mixtures
	1.1.6 Bark (from forestry operations)[a]	



Design Mixture - 100% Coniferous.
[a] Max 1% bark only from logging operations - residuals on site.
No short rotation coppice, no brush or bushes, no leaves, no needles.

E = MC³ ©

Fiber Statistics: Specifications – Classification & Testing

Supply Specifications for Co-firing of CHP Plants UK

Targeted specifications can be met for preferential off-take.

Certifications:	Sustainability Forestry Initiative® (SFI) Standards and Certified Responsible Forestry® (FSC) Standards.	
Species:	Coniferous:	Spruce, Pine, Fir and Hemlock
Bark Content	< 2%	Predicted to meet Ash requirement - can debark to < 1%

Characteristics	Unit	Basis	Typical	Min.	Target	Max.	Table
Total Moisture	%	AR		30	35	40	
Ash Content	%	OD			< 1		
Greens							
Leaves	%	AR	None				
Pine Needles	%	AR	None				
Foreign Matter	%	AR	None				
Particle Sizes:	*mm*			*mm*			
Overs	%	AR		> 40 x 20		0	
Accepts	%	AR		≤ 40 x 20		95	
Unders	%	AR		≤ 1 mm		5	
Chlorine	%	OD				< .10	Trace Amt.
Sulpher	%	OD				< .05	
Nitrogen	%	OD				< .70	

For Buyer A. R. = As Received *(For Seller A. D. = As Delivered)*
Oven Dry = OD

The Impact of Bark Content of Wood Biomass on Biofuel Properties; Holubcik, Michael & Jandacka, Jozef Peer Reviewed Article; Bioresources.com Department of Power Engineering, Faculty of Mechanical Engineering, University of Zilma, Univerzitma 1, 010 26 Zilma, Slovakia Radovan.nosek@fstroj.uniza.sk Retrieve from: https://bioresources.cnr.ncsu.edu/BioRes 11/BioRes 11 1 44 Nosek HJ Impact Bark%2
Finding: Ash content decreses in the range of .0333 to .0444% per 1% decrease in bark content.

<u>Production and Delivery Methodology:</u>
All processed materials shall be in accordance with Sustainability Forestry Initiative® (SFI) Standards and with Certified Responsible Forestry® (FSC) Standards.

Heat treatment as defined by the application of 56°C for a minimum duration of 45 continuous minutes throughout the entire profile of the wood (including at its core).

E = MC^3© Heat treatment Predicted to meet 60°C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood (including at its core).

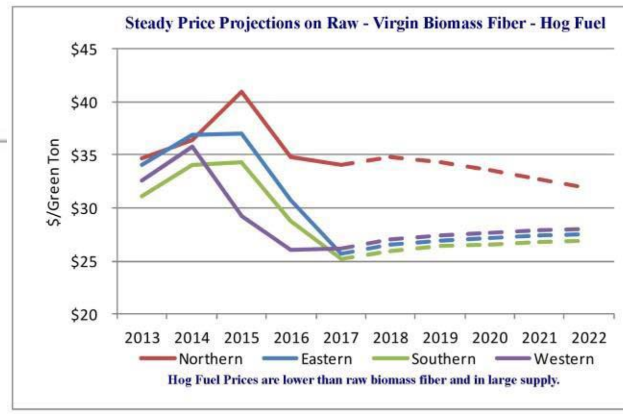
	Specific Gravity	Density (lb/ft^3)	Weight per Cord (lb/cord)	Specific Gravity	Density (lb/ft^3)	Weight per Cord (lb/cord)
Sampled Softwood						
Spruce, Canadian		34		0.45	28.0	
Pine, Northern White		36			25.0	
Fir, Balsam		45			25.0	
Hemlock, Eastern		50			28.0	
				Average SW	26.5	

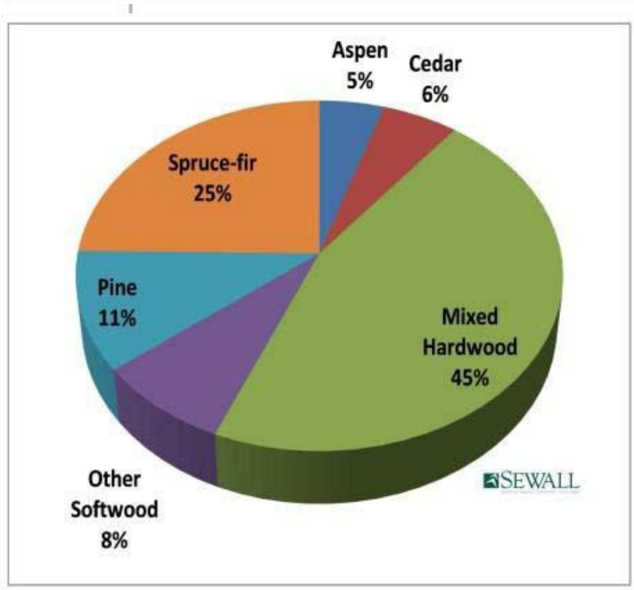
Fiber Statistics: Specifications – Classification & Testing

Total Acres - Millions

Timberland Acres - Million

Species	*Scientific Name*	*Regions Available*	*Green MC*	*Green Lbs./CF*	*Est. 40% MC Lbs./CF*	*20% MC Lbs./CF*	*BTU - Cord Dried*	*Forest Vol. Today*	*17.7 14.2*	*Forest Vol. 2060*
Eastern White Pine	Pinus strobus	ME & E. CA	50%	36	32	25	14.30	5.2%	920,400	899,600
Eastern/Red Spruce	Picea rubens	ME & E. CA	50%	34	30	28	15.90	17.4%	3,079,800	3,010,200
Eastern Balsam Fir	Abies balsamea	ME & E. CA	50%	45	40	25	14.30	15.2%	2,690,400	2,629,600
Eastern Red Cedar	Juniperus virginiana	ME & E. CA	50%	28	25	22	12.20	10.3%	1,823,100	1,781,900
Eastern Hemlock	Tsuga canadensis	ME & E. CA	50%	50	44	28	15.90	5.8%	1,026,600	1,003,400
						Timberland Acres - Million		53.9%	9,540,300	9,324,700





1641 Sigman Road
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Conyers, GA 30012
1-770-922-8000 ext 303
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BEL
BIOMASS ENERGY LAB

Report of Analysis

BEL2690
TS Laurent - Osahada of Maine, LLC
East Main Street
RT 1 Searsport, ME 04974

Company Contact: Art 207-930-5168

BEL ID Number:	BEL190245-1	**Sample Weight (kg):**	1.38
Product / Commodity:	Wood Chips Fresh Cut	**Sample Received:**	2/11/2019
Sample Designation:	50% Hemlock- 20% Pine - 15% Spruce - 5% Fir	**Report Date:**	2/21/2019
Date Sampled:	2/19/2019	**Report Code:**	
		Purchase Order #:	

Parameter	As-Received	Dry Basis	Analytical Method
Total Moisture (%)	43.59		ISO 18134-1
Ash (%)	0.28	0.49	ISO 18122
Volatiles (%)	45.22	80.16	ISO 18123
Fixed Carbon (%)	10.90	19.34	By Difference
GCV (GJ/Tonne)	11.77	20.87	ISO 18125
NCV cV (GJ/Tonne)	10.07	19.63	ISO 18125
NCV cP (GJ/Tonne)	9.97	19.56	ISO 18125
Carbon (%)	29.75	52.73	ISO 16948
Hydrogen (%)	3.37	5.98	ISO 16948
Nitrogen (%)	0.07	0.12	ISO 16948
Oxygen (%)	22.94	40.67	ISO 16948
Sulfur (%)	0.01	0.01	ISO 16994
Chlorine (%)	< 0.005	< 0.005	ISO 16994

All samples cut in Waldo and Hancock County - Maine. All samples were air dried for 30 days then debarked and chipped on day 32. Samples were then sent to the lab for testing.

Prepared By:

David Robles - Assistant Laboratory Manager

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Report of Analysis

BEL-ME201111
Osahada of Maine
177East Main Street
Searsport, ME 04974

Contact: Arthur House

BEL ID Number:		**Sample Weight (kg):**	4.95
Product / Commodity:	ME201111	**Sample Received:**	3/24/2019
Sample Designation:	Wood Chips	**Report Date:**	3/31/2019
Date Sampled:	Fresh Cut	**Report Code:**	
	Hemlock Chips	**Purchase Order #:**	
	3/12/2019		

Parameter	As-Received	Dry Basis	Analytical Method
Total Moisture (%)	52.54		CEN/EN 14774-1
Ash (%)	0.20	0.43	CEN/EN 14775
Volatiles (%)	39.02	82.21	CEN/EN 15148
Fixed Carbon (%)	8.23	17.35	By Difference
GCV (GJ/Tonne)	9.83	20.71	CEN/EN 14918
NCV cV (GJ/Tonne)	8.02	19.46	CEN/EN 14918
NCV cP (GJ/Tonne)	7.92	19.39	CEN/EN 14918
Carbon (%)	24.60	51.84	CEN/EN 15104
Hydrogen (%)	2.89	6.09	CEN/EN 15104
Nitrogen (%)	0.11	0.23	CEN/EN 15104
Sulfur (%)	< 0.01	0.01	CEN/EN 15104
Oxygen (%)	19.65	41.41	CEN/EN 15104
Chlorine (%)	< 0.005	< 0.005	CEN/EN 15289

Prepared By:

Christopher Cox - Laboratory Manager

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Report of Analysis

Osahada of Maine
177East Main Street
Searsport, ME 04974

Company Contact: Art House

BEL ID Number(s):	BEL-ME11001	**Sample Weight (kg):**	3.65
Product/Commodity:	Biomass	**Sample Received:**	3/7/2019
Sample Designation:	Hog Fuel Biomass	**Report Date:**	3/14/2019
Packaging:	Plastic Bag	**Report ID:**	BEL-ME11001
Date Sampled:	N/A	**Purchase Order #**	N/A

Compositional Analysis: Proximate/Ultimate Analysis

Parameter	As-Received	Oven Dry	Analytical Method
Total Moisture (%)	23.62		CEN/EN 14774-1
Ash (%)	0.98	1.29	CEN/EN 14775
Volatiles (%)	62.58	81.93	CEN/EN 15148
Fixed Carbon (%)	12.81	16.78	By Difference
Gross Calorific Value (GJ/Tonne)	15.56	20.37	CEN/EN 14918
Net Calorific Value (cV)(GJ/Tonne)	14.04	19.10	CEN/EN 14918
Net Calorific Value (cP)(GJ/Tonne)	13.96	19.03	CEN/EN 14918
Carbon (%)	38.89	50.91	CEN/EN 15104
Hydrogen (%)	4.71	6.16	CEN/EN 15104
Nitrogen (%)	0.26	0.33	CEN/EN 15104
Sulfur (%)	0.01	0.01	CEN/EN 15289
Oxygen (%)	31.54	41.29	By Difference
Chlorine (ppm)			ASTM D6721

Prepared By:

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BIOMASS ENERGY LAB

Report of Analysis

Osahada of Maine
177 East Main Street
Searsport, ME 04974

Company Contact: Art House

BEL ID Number(s):	BEL190101	**Sample Weight (kg):**	5.67
Product/Commodity:	Wood Chips	**Sample Received:**	7/31/2018
Sample Designation:	Mixed Conifers	**Report Date:**	8/8/2018
Packaging:	Plastic Bag	**Report ID:**	BEL-ME190101
Date Sampled:	N/A	**Purchase Order #**	N/A

Compositional Analysis: Proximate/Ultimate Analysis

Parameter	As-Received	Oven Dry	Analytical Method
Total Moisture (%)	28.96		CEN/EN 14774-1
Ash (%)	2.66	3.74	CEN/EN 14775
Volatiles (%)	56.77	79.91	CEN/EN 15148
Fixed Carbon (%)	11.59	16.32	By Difference
Gross Calorific Value (GJ/Tonne)	13.28	18.69	CEN/EN 14918
Net Calorific Value (cV)(GJ/Tonne)	11.74	17.47	CEN/EN 14918
Net Calorific Value (cP)(GJ/Tonne)	11.65	17.40	CEN/EN 14918
Carbon (%)	33.68	47.41	CEN/EN 15104
Hydrogen (%)	4.22	5.94	CEN/EN 15104
Nitrogen (%)	0.32	0.46	CEN/EN 15104
Sulfur (%)	0.02	0.03	CEN/EN 15289
Oxygen (%)	30.14	42.42	By Difference
Chlorine (ppm)			ASTM D6721

Prepared By:

$E = MC^3$ ©

3.) Curtail Carbon Intensive Trucking to Reduce GHG Emissions

More than 70,000 US tons of wood harvested, transported, and delivered *every day* from US forests = 2,333 Truck Load Movements per day [21]

Carbon Emission Analysis

Assume all truck transport is regional and located within 50-miles of the facility.

Export Commodity:	Industrial Wood Pellets for CHP
Export Volume:	13,600,000,000 Metric Tonnes
U.S. Tons Required:	32,600,000 Short Tons of Raw Whole Tree Fiber
US Tons Per Truckload:	30 US Short Ton or 27 Metric Tonnes per load
Total Truckloads Required:	1,088,000 Truck loads
Distance - Harvest to Plant:	50 miles (each way) or 100-miles per load (averaged)
Total Miles Traveled:	54,400,000 Miles Driven
Carbon Calculations:	Average truck in US emits 161.8 grams of CO2 per ton mile
Total Carbon Emitted:	54,400,000 ton miles X 161.8 grams = 8,802 MT Annually

Projected 2030 Export Volume - in MT Converted to US Short Tons

Calculated by Miles Required to Deliver to Facility

Ton Miles	*Grams CO2*	*Total Grams*	*Annual MT CO2*
54,400,000	161.8	8,801,920,000	8,802

Medium- and heavy-duty trucks in the United States emitted 444 million metric tons of carbon dioxide equivalent in 2019. Greenhouse gas emissions from these modes of transportation have increased by more than 90 percent since 1990. It is estimated that the U.S. accounts for 18 percent of global road freight CO2 emissions. Source: *Statista, Published by Ian Tiseo, Apr 23, 2021* [22]

4.) Transition to Rail Transport – GHG Emission Reduced 84%

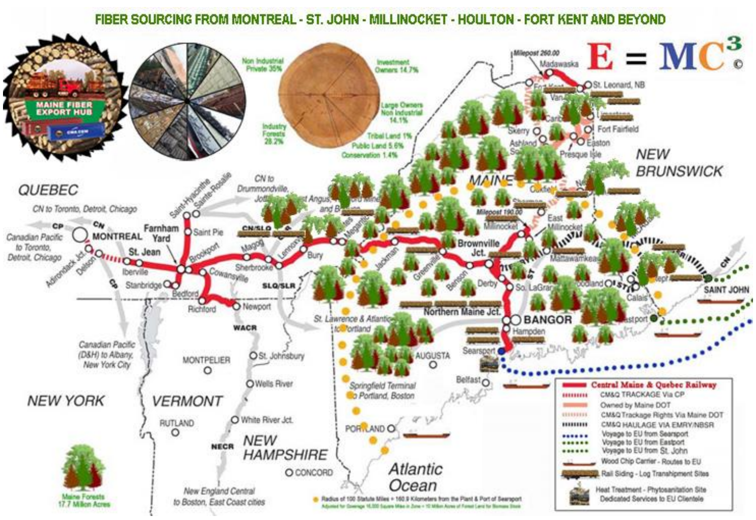
Log Truck 300,000 UST per year to Facility

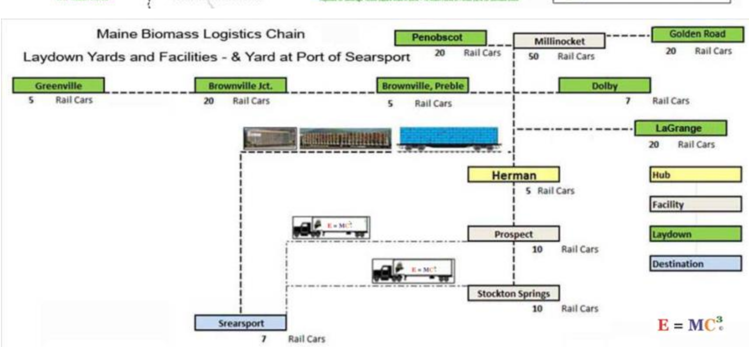
Distance Miles	Weight Cargo UST	Emission Factor	Grams of CO_2	MT of CO_2	$ Per Loaded Mile Truck	$ Per Truck	$ Per US Ton	$ for 300 USTPY	Annual Tons	Annual Loads	Grams of CO_2	MT of CO_2 Per Load	
200	30	161.8	970800	0.971	$ 3.50	$ 700.00	$ 23.33	$ 7,000,000	300,000	10,000	9,708,000,000	9,708	100%
175	30	161.8	849450	0.849	$ 3.50	$ 612.50	$ 20.42	$ 6,125,000	300,000	10,000	8,494,500,000	8,495	100%
150	30	161.8	728100	0.728	$ 3.50	$ 525.00	$ 17.50	$ 5,250,000	300,000	10,000	7,281,000,000	7,281	100%
125	30	161.8	606750	0.607	$ 3.50	$ 437.50	$ 14.58	$ 4,375,000	300,000	10,000	6,067,500,000	6,068	100%
100	30	161.8	485400	0.485	$ 3.50	$ 350.00	$ 11.67	$ 3,500,000	300,000	10,000	4,854,000,000	4,854	100%
75	30	161.8	364050	0.364	$ 3.50	$ 262.50	$ 8.75	$ 2,625,000	300,000	10,000	3,640,500,000	3,641	100%
50	30	161.8	242700	0.243	$ 3.50	$ 175.00	$ 5.83	$ 1,750,000	300,000	10,000	2,427,000,000	2,427	100%
25	30	161.8	121350	0.121	$ 3.50	$ 87.50	$ 2.92	$ 875,000	300,000	10,000	1,213,500,000	1,214	100%
						Average	$ 13.13	$ 3,937,500			Average	5,461	100%

Rail Car 300,000 UST per year to Facility

Distance Miles	Weight Cargo UST	Emission Factor	Grams of CO_2	MT of CO_2	$ Per Loaded Mile Rail	$ Per Rail Car	$ Per US Ton		Annual Tons	Annual Loads	Grams of CO_2	MT of CO_2 Per Load	
200	75	22.9	343500	0.344	$ 4.13	$ 825.00	$ 11.00	$ 3,300,000	300,000	4,000	1,374,000,000	1,374	14%
175	75	22.9	300563	0.301	$ 4.50	$ 787.50	$ 10.50	$ 3,150,000	300,000	4,000	1,202,250,000	1,202	14%
150	75	22.9	257625	0.258	$ 5.00	$ 750.00	$ 10.00	$ 3,000,000	300,000	4,000	1,030,500,000	1,031	14%
125	75	22.9	214688	0.215	$ 5.70	$ 712.50	$ 9.50	$ 2,850,000	300,000	4,000	858,750,000	859	14%
100	75	22.9	171750	0.172	$ 6.75	$ 675.00	$ 9.00	$ 2,700,000	300,000	4,000	687,000,000	687	14%
75	75	22.9	128813	0.129	$ 8.50	$ 637.50	$ 8.50	$ 2,550,000	300,000	4,000	515,250,000	515	14%
50	75	22.9	85875	0.086	NA	NA	NA		300,000	4,000	343,500,000	344	14%
25	75	22.9	42937.5	0.043	NA	NA	NA		300,000	4,000	171,750,000	172	14%
							$ 9.75	$ 2,925,000			Average	773	14%
Transition Point						Average Savings	26%	$ 1,012,500 26%				GHG Reduced	86%

Target Procurement = ~ 70% of Fiber Inbound by Rail and ~ 30% on Local Trucks





Other Benefits of Rail:

- Rail sidings located ~ 50 miles apart
- ~ 2.5 Truckloads per rail car
- Loggers increase fiber supply 2.5x
- Opens Work to Smaller Companies
- Residuals/Slash Removed Faster
- Thinning/Clearing more Efficient
- Reduced Forest Fire Hazards
- Reduced truck traffic
- Lower accident incidents
- Increase rail service (efficiencies)
- Activates rail service
- Provides Job Opportunities
- Enhances Local Economies

To: **Searsport Fiber Hub Inbound Fiber 65% to 70% - By rail to reduce truck use - reduce GHG by ~ 86%**

E = MC3

5.) Centralize Fiber, Aggregate, Classify, Process for Quality Assurance

Fiber Hub at End of Rail & 1,500 feet from Dock

Cost Efficiencies by Operating Fiber Hub – Aggregation Yard

Production of Low Cost – Low Value Residual and Waste Fiber

Blending Material From Various Sources to Achieve Low Cost Conifer - Softwood Fiber Only

Fiber As-Received: Average 50-mile Radius Description	Annual US Ton Available	Value Per US Ton As Received	Extended Yard Cost Received	Tipping Fee Paid to Yard	Blended Values Net Yard Costs
Residual Derived from Merchantable Harvests	150,000	$ 29.00	$ 4,350,000		$ 4,350,000.00
Small Diameter From Forest Clearing	250,000	$ 32.00	$ 8,000,000		$ 8,000,000.00
Whole Tree Residual Softwood Chipped in Forest by Logger	90,000	$ 34.00	$ 3,060,000		$ 3,060,000.00
Lumber Mill - Factory Residuals, Shavings, and Waste	6,000	$ 28.00	$ 168,000		$ 168,000.00
Tree Clearing - Thinnings, Trimmings - Power Line Maintenance	10,000	$ (10.00)		$ 100,000.00	$ (100,000.00)
Residential Debris - Roadside Cleaning - Clean Debris and Waste	5,000	$ (10.00)		$ 50,000.00	$ (50,000.00)
Disaster Clearing - Fire Prevention Contractors	5,000	$ (15.00)		$ 75,000.00	$ (75,000.00)
Municiple Removals - Softwood Only - Received to Yard	500	$ (25.00)		$ 12,500.00	$ (12,500.00)
Totals	516,500	$ 7.88		$ 237,500	$ 15,340,500

Research Sample of Materials: Conducted 2020 thru 2022

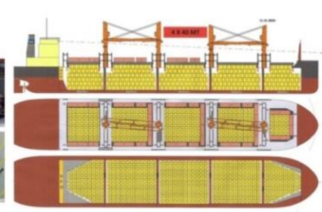
NET Cost Received to Yard p/US-T $ 29.70

Note: With cooperation and goal sharing by Strategic Alliance Partners one can consistently achieve these low costs targets of raw fiber before processing through the Phytosanitation System.










From Forest to Furnace – Streamlined – Toward Carbon Neutral

E = MC³ ©

6.) Exceed EU-2014 Import Mandate – Phytosanitation

"On June 17, 2014 the European Union published amendments to its principle plant health directive (Council Directive 2000/29/EC) which regulates the import of plants and plant products including forestry products. Member countries of the European Union are to adopt the requirements within their laws, regulations, etc. by 30 September 2014. The Requirements will come into force for imports arriving on or after October 1, 2014. Wood must be: - heat Treated or…. by using approved processes. At present the E.U. has not approved any fumigation products. Heat treatment is defined as the application of 56°C for a minimum duration of 30 continuous minutes throughout the entire profile of the wood (including at its core)."

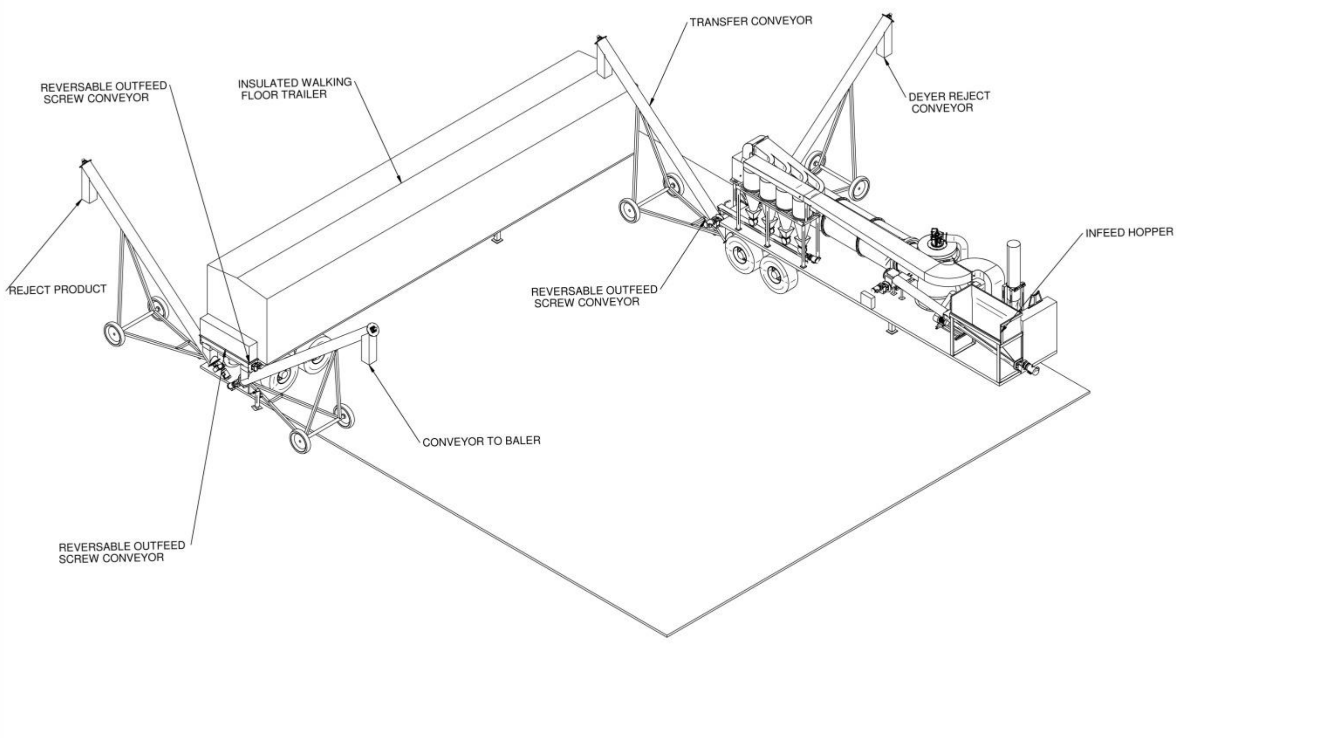
Since 1945 Thompson Dryers have been pioneering drying; patenting, perfecting and servicing dryer systems across many industries. Take a tour around one of our single-pass rotary drying systems. Thompson's believes equipment should work like it's supposed to and you deserve the very best solution for your drying needs. [24]

Trailer Mounted Phyto Heater Dryer

520 Trailer Mounted Phyto Heater Dryer System

Design Drawing Only: TD Dryers

Wood Chip No Bark	*MT Year*	*MC%*
Feedstock - In	165,000	35
Feedstock - Out	150,000	30



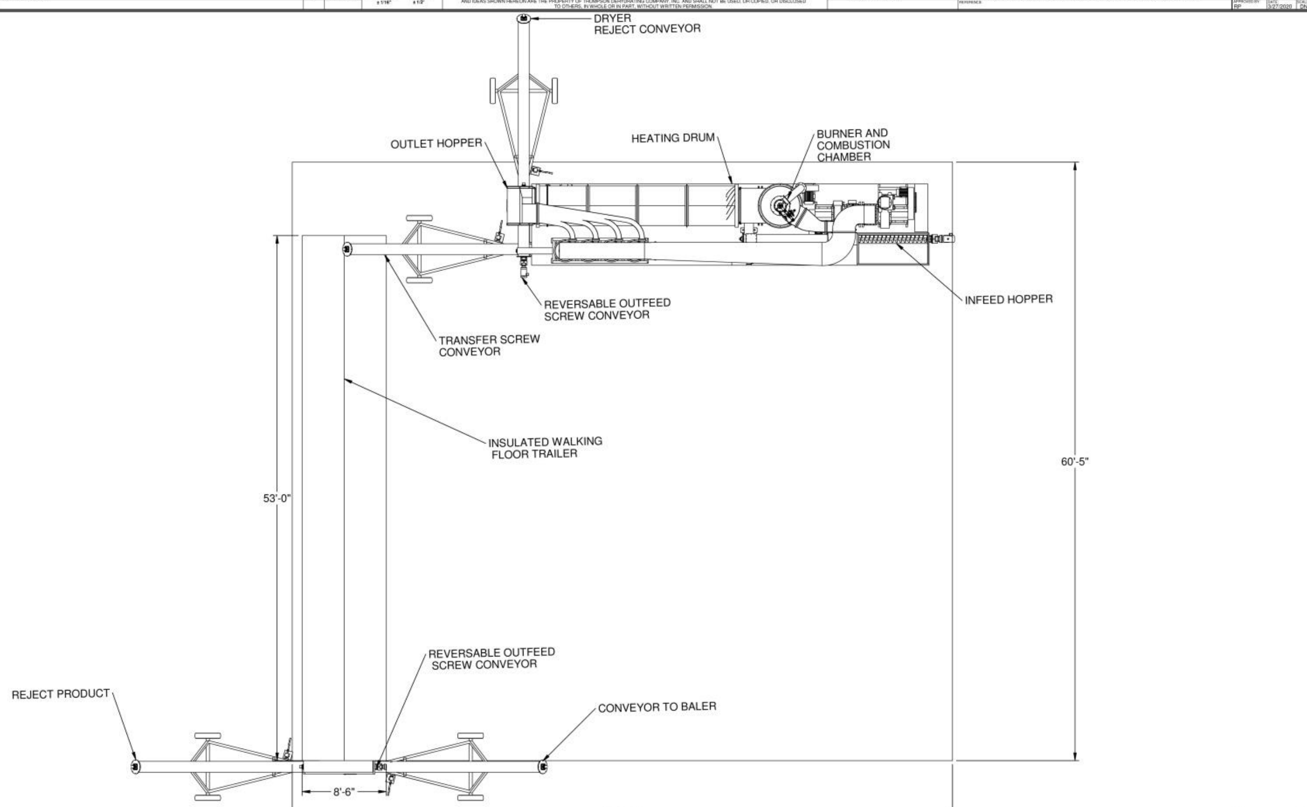
SHEET: 1 OF 4

NO.	REVISION DESCRIPTION:	BY:	DATE:
A	INITIAL ISSUE	RP	03/27/20

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN FT - IN
FRACTIONS ± 1/16" ANGLES ± 1/2°

THOMPSON DRYERS 2953 SW WANAMAKER DRIVE, TOPEKA, KANSAS 66614 (785) 272-7722

MATERIAL: AS NOTED
WEIGHT: 32601 lbm
DRAWING NUMBER: 42--PHYTO-00
DESCRIPTION: 4'-6" TRAILER MOUNTED PHYTO SYSTEM
REFERENCE:
MODELED BY: MWC DATE: 3/27/2020 REVISION: A
DRAWN BY: MWC DATE: 3/27/2020
APPROVED BY: RP DATE: 3/27/2020 SCALE: DNS



SHEET: 2 OF 4

NO.	REVISION DESCRIPTION:	BY:	DATE:
A	INITIAL ISSUE	RP	03/27/20

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN FT - IN
FRACTIONS ± 1/16" ANGLES ± 1/2°

THOMPSON DRYERS 2953 SW WANAMAKER DRIVE, TOPEKA, KANSAS 66614 (785) 272-7722

MATERIAL: AS NOTED
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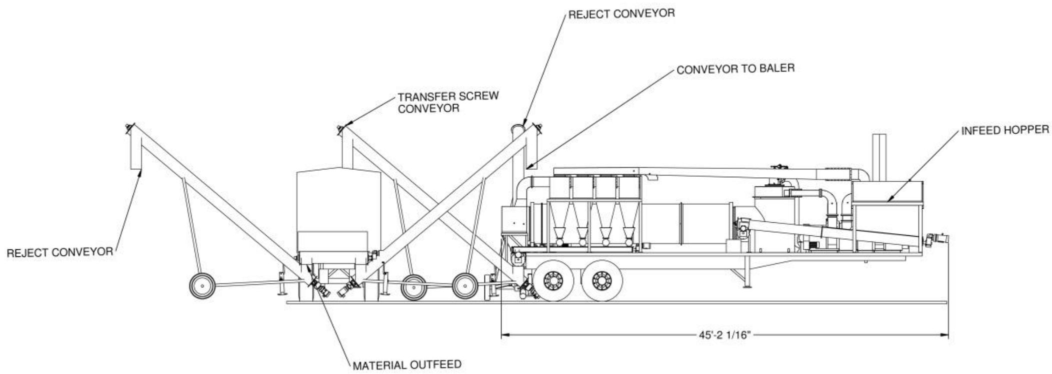
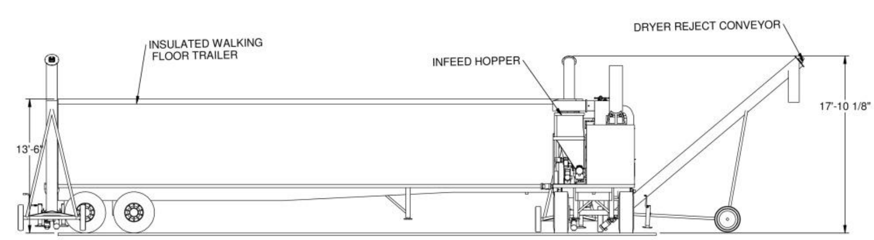
DRAWN BY: MWC DATE: 3/27/2020
APPROVED BY: RP DATE: 3/27/2020 SCALE: DNS

E = MC³ ©



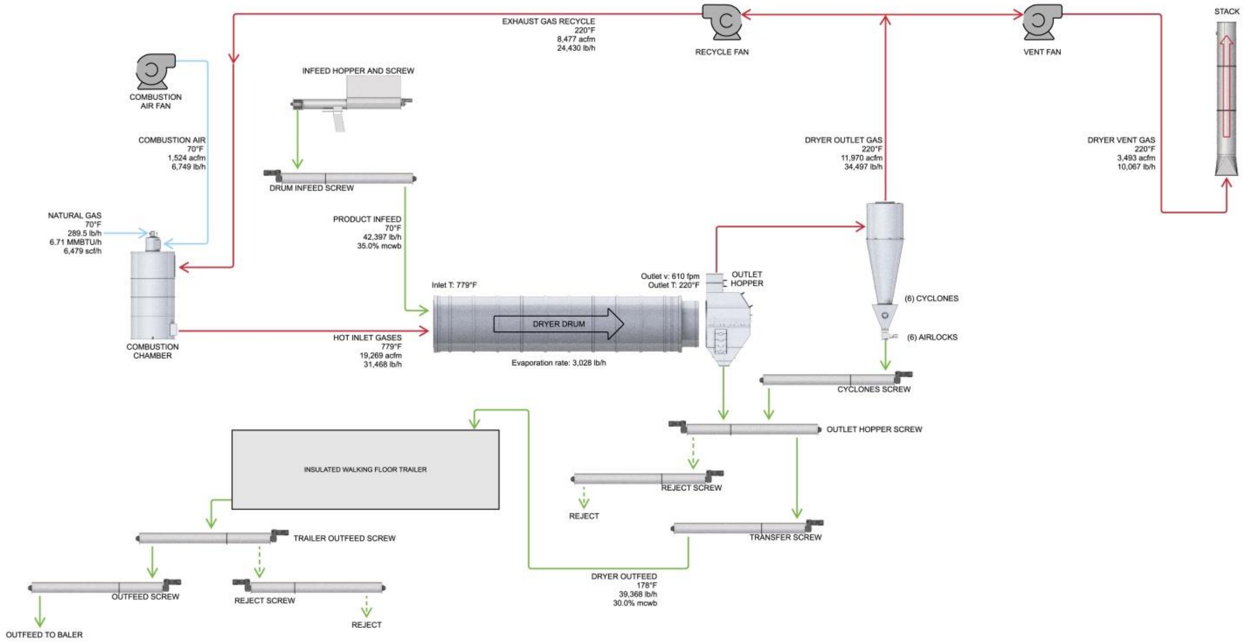
SHEET: 3 OF 4

NO.	REVISION DESCRIPTION:	BY:	DATE:	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN FT - IN	THOMPSON DRYERS	2953 SW WANAMAKER DRIVE, TOPEKA, KANSAS 66614 (785) 272-7722	MATERIAL: AS NOTED	DRAWING NUMBER: 42--PHYTO-00	MODELED BY: MWC	DATE: 3/27/2020	REVISION
A	INITIAL ISSUE	RP	03/27/20	FRACTIONS ± 1/16" ANGLES ± 1/2°	THIS DRAWING IS THE PROPERTY OF THOMPSON DEHYDRATING COMPANY, INC. IT IS LENT AND IS TO BE RETURNED UPON REQUEST. THE DESIGN AND IDEAS SHOWN HEREON ARE THE PROPERTY OF THOMPSON DEHYDRATING COMPANY, INC. AND SHALL NOT BE USED, OR COPIED, OR DISCLOSED TO OTHERS, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION.		WEIGHT: 32601 lbm	DESCRIPTION: 4'-6" TRAILER MOUNTED PHYTO SYSTEM	DRAWN BY: MWC	DATE: 3/27/2020	A
								REFERENCE:	APPROVED BY: RP	DATE: 3/27/2020	SCALE: DNS



SHEET: 4 OF 4

NO.	REVISION DESCRIPTION:	BY:	DATE:	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN FT - IN	THOMPSON DRYERS	2953 SW WANAMAKER DRIVE, TOPEKA, KANSAS 66614 (785) 272-7722	MATERIAL: AS NOTED	DRAWING NUMBER: 42--PHYTO-00	MODELED BY: MWC	DATE: 3/27/2020	REVISION
A	INITIAL ISSUE	RP	03/27/20	FRACTIONS ± 1/16" ANGLES ± 1/2°	THIS DRAWING IS THE PROPERTY OF THOMPSON DEHYDRATING COMPANY, INC. IT IS LENT AND IS TO BE RETURNED UPON REQUEST. THE DESIGN AND IDEAS SHOWN HEREON ARE THE PROPERTY OF THOMPSON DEHYDRATING COMPANY, INC. AND SHALL NOT BE USED, OR COPIED, OR DISCLOSED TO OTHERS, IN WHOLE OR IN PART, WITHOUT WRITTEN PERMISSION.		WEIGHT: 32601 lbm	DESCRIPTION: 4'-6" TRAILER MOUNTED PHYTO SYSTEM	DRAWN BY: MWC	DATE: 3/27/2020	A
								REFERENCE:	APPROVED BY: RP	DATE: 3/27/2020	SCALE: DNS



AMBIENT TEMPERATURE: 70°F
ELEVATION: 120 ft

PRELIMINARY

Thompson 520 Mobile Wood Phytosanitary Heater

Design production

Description:

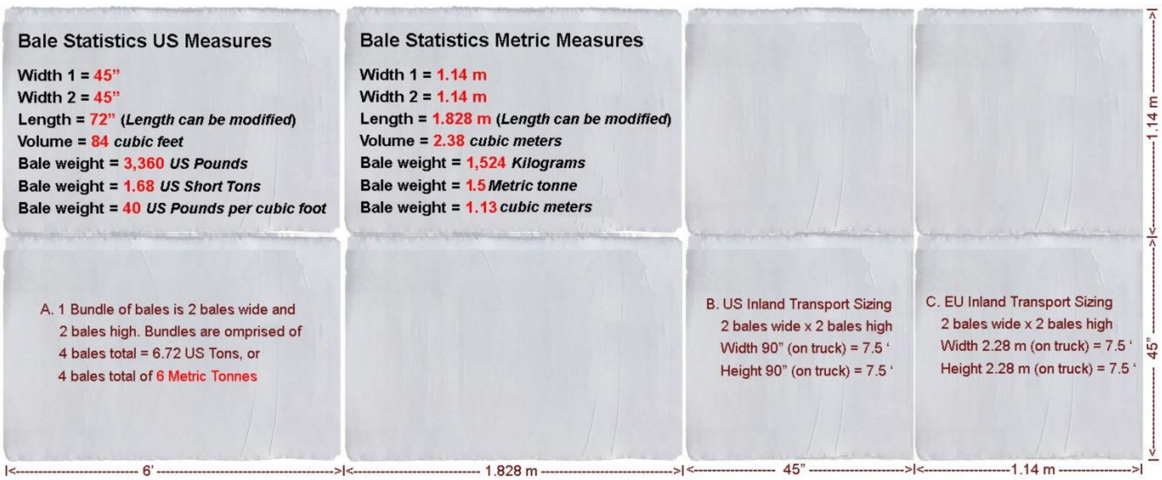
5-ft-diameter trailer-mounted Thompson woodchip phytosanitary heater, 150,000-t/y design outfeed production.

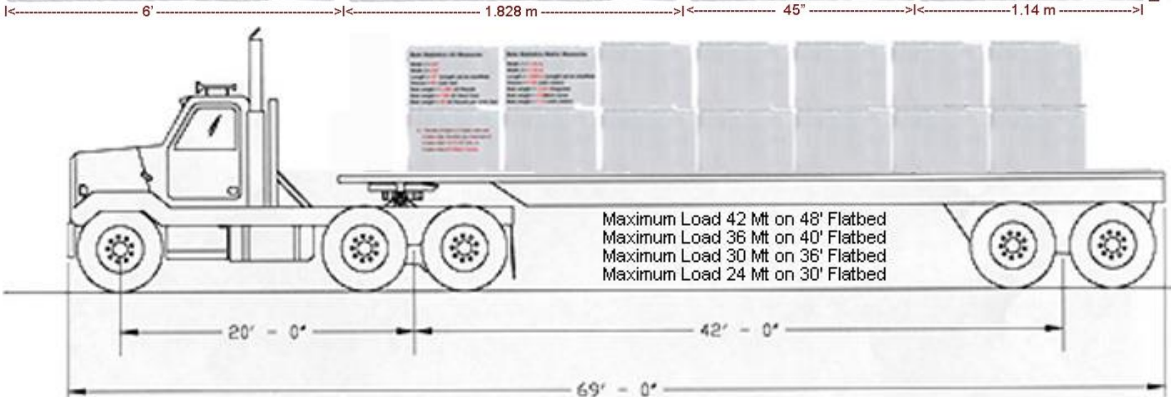
Project: Mobile Phyto
Revision: 2
Date: 23-Feb-2021
By: Parker Robb
Page: 1 of 1

Thompson Dehydrating Company, Inc.
2953 SW Wanamaker Dr, Topeka, KS 66614
+1 (785) 272-7722

7.) Densify for Effective, Efficient and Low Cost Material Handling

APOLLO





E = MC³ ©

The Apollo ISC Big Bale Press (BBP65) is part of our Big Bale Packaging and the most efficient and flexible compressing and packing system available on the market today. The Big Bale press in itself is a compact, fully automatic installation for compressing, packing and palletizing bulk products. The Big Bale Press can be used for a wide range of compressible and cohesive products, such as peat, biomass and compost. As designed this system will bale up to 300,000 Metric Tonnes of wood chips annually, with a compression ratio of ~ 1.65 to 1 (roughly 24.5 lbs/cf to 40.4 lbs/cf in bale. [25]

Rock Solid - Perfectly Sized to Fit:

Shipping Containers – No Wasted Space

Tightly Arranged Vessel – handy sized 28 – 30 KMt

US & EU Trucks/Rail and Transport

Different De-baler Systems

Slicing – 100 Mt Per Hour

Trommel - Stripper

8.) **Eliminate**:

Costly Silo Storage or Warehouse Buildings,


Chip-Pile Management,


Port Handling – Movement& Covering,


Inclement Weather – Climate Exposure.

Bales are hermetically sealed in a watertight and airtight sturdy plastic seal wrapping. Wrapping is Double layered to provide strong, rigid, and nearly Impenetrable during movement, storage, loading And unloading and long-term inventory stacking. Quality and Integrity can be held a year – outside.

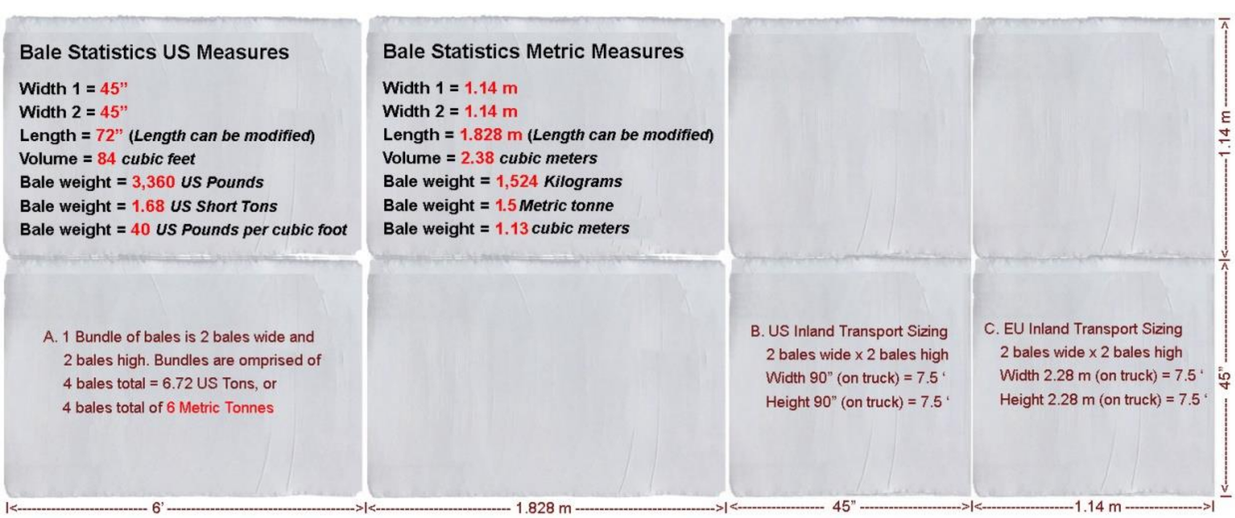
$E = MC^3$ ©

9.) Ocean Freight cost Reduction exceed Pellet Density/Stowage Value

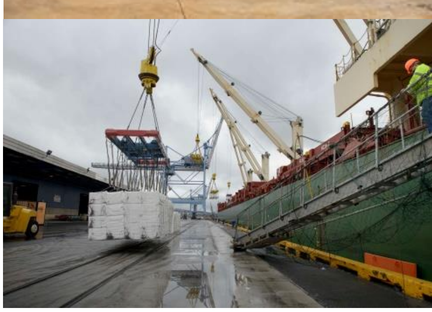
Ocean freight costs are directly related to the stowage value of any commodity. Industrial wood pellets weigh 40 lbs/cf. E=MC^3© densified biomass chips weigh 40.6 lbs/cf or slightly more comparable to industrial wood pellets. Therefore, these two commodities weighing the same; there is no appreciable difference in the ocean freight density, stowage or loading variables. The stowage per vessel is equal.

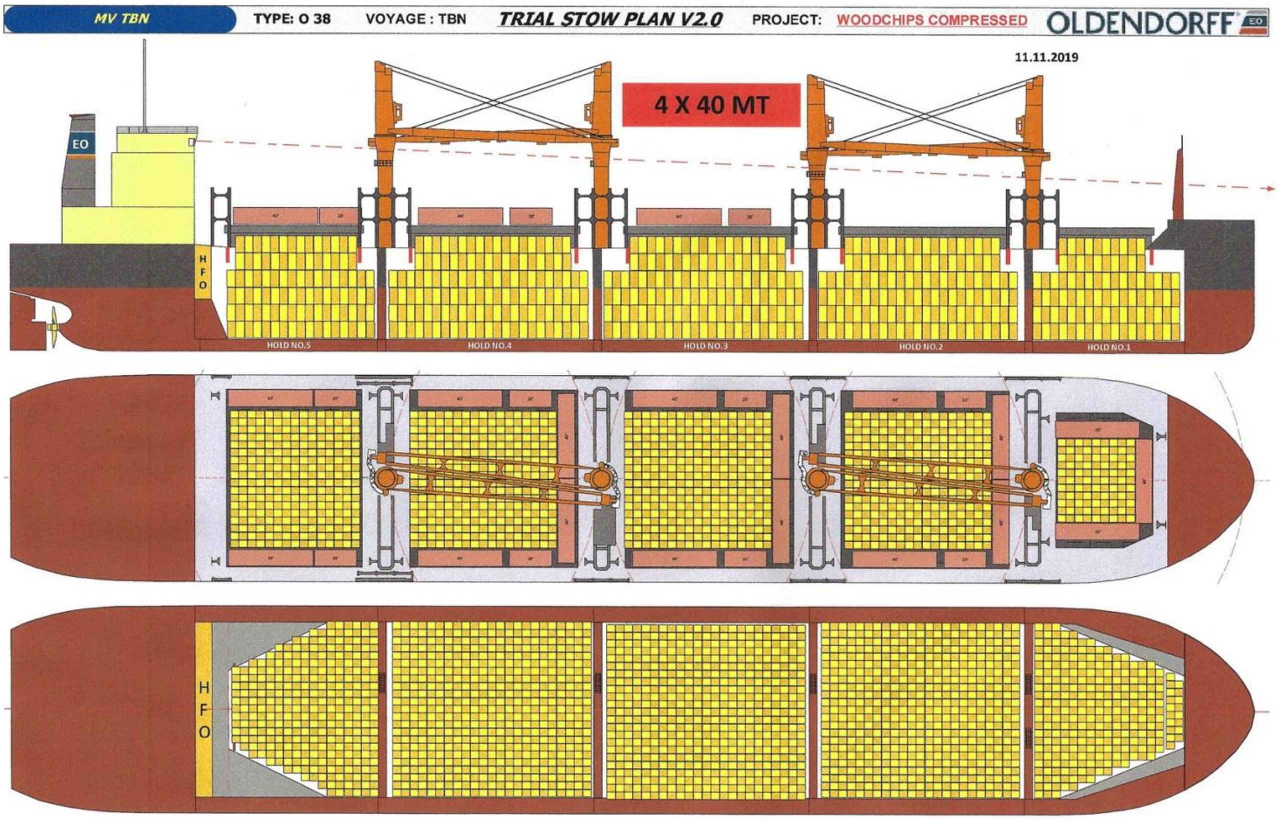
They will have the same stowage as each other, but the ocean freight will differ in the exception that the ocean distance for industrial wood pellets is from Savannah, GA, USA to Liverpool GP with a distance of 3629.86 mi, (6722.49 km). The transit time is: 11 days 15 hours at an average speed of: 13 knots.

E=MC^3© is from Searsport, ME, USA to Liverpool GP with a distance of 2681.05 mi, (4965.29 km). The transit time is: 8 days 14 hours at an average speed of: 13 knots. This is a 3-day or 27% reduction of time on water each way or a 6-day round trip sailing time reduction, which allows more vessel turn around trips each year. [26]



Vessel Loading Configurations – System and Equipment





CAPT. H.VISSER
PORTOPS-STA@OLDENDORFF.COM

Load Perfection:

OLDENDORFF

28-30 KMT Cargo – <u>Handy size</u> Under & Below Hatch

- **Tightly Arranged Vessel**
- **3 Cranes on Board**
- **24 Mt Per Cranston Bar**
- **7 Turns Per Hr (24 MT EA)**
- **168 MT P/hr per/Crane**
- **504 MT per Hr Total**
- **60 Hrs. to Load ~ 30 KMt**
- **~ 3 Days in Port**
- **Reciprocal Back Hauls (*may be arranged*)**
- **Same Ports – Same Type Loads (*may be arranged*)**
- **5 Dedicated Loads Per Year – for 150 KMTPY cargo**
- **150,000 MT Potential per Dryer System**
- **Dual HT System = 300 KMTPY – With 2nd Dryer**
- **10 Dedicated Loads Per Year – for 300 KMTPY cargo**

10.) Achieve Efficiency by promoting Strategic Alliances.

Strategic Alliances are established by and between landowners, loggers and transportation professionals. All fiber sourced is strictly derived of forest residuals and waste materials. No trees are harvested for this entire project. No forest land/acreage is deforested.

Relationships are established with Canadian Pacific Rail for transport and several laydown yards have been identified to enhance supply chain efficiency. Reliance upon rail transport will replace truck traffic and carbon emissions by roughly 86%. The Searsport laydown yard is under site control for 30-years with land lease cost at below market rate in consideration to an exchange for pass through costing, whereby payment is made upon loading and shipping vessels.

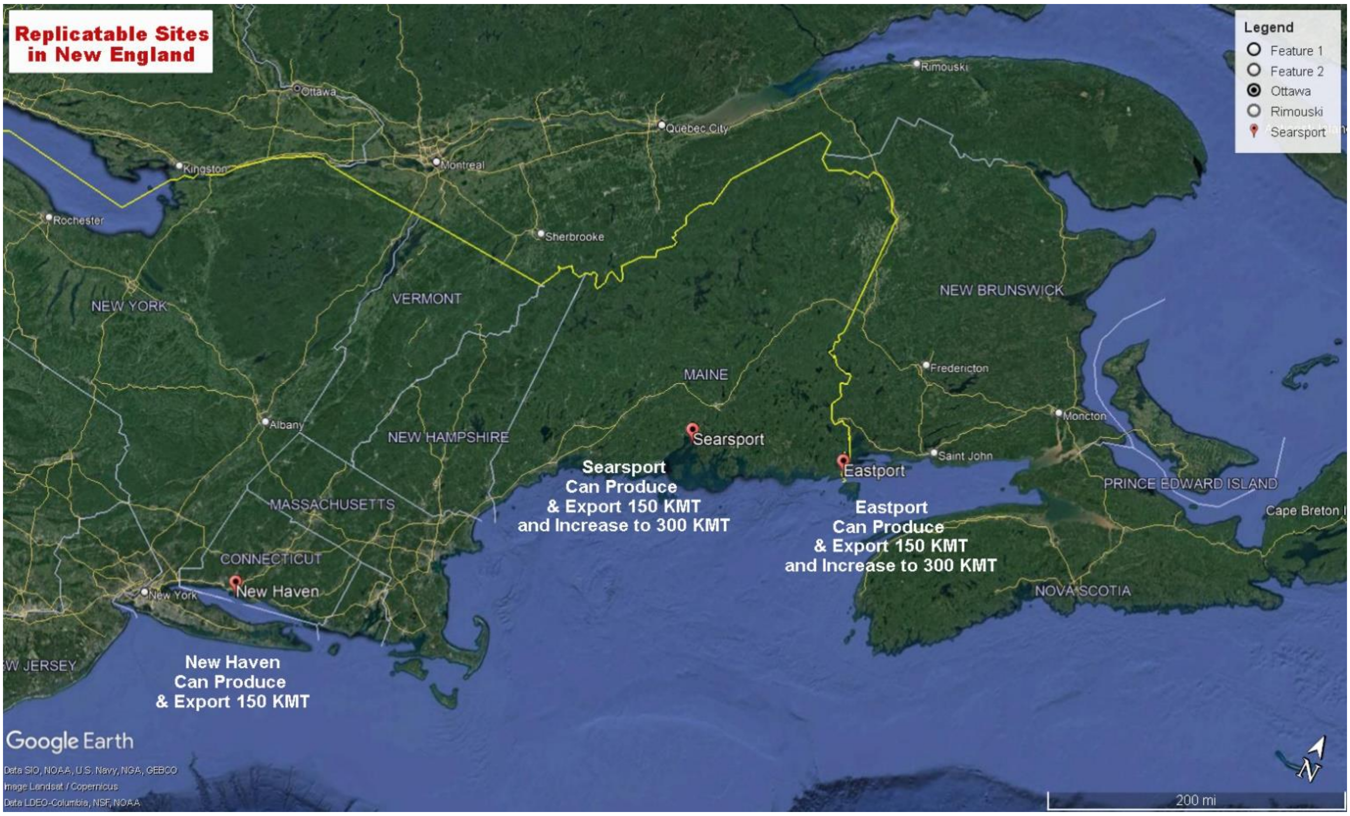
The aggregate yard acts as the central handling facility to ensure exacting specifications, in both quality, species, and sizing – also, to maintain a consistent and exacting record of Phytosanitation processes. The EU mandate of 56°C for 30 minutes to the core is exceeded at 60°C for 45minutes to the core (in expectation of increased mandates).

Densification of wood chips lowers the ocean freight rate and delivery time. The absence of need for buildings, chip piles, silos and costly port handling mitigates cost and environmental exposure to the commodity.

Direct contract relationships by Oldendorff Shipping and buyers or end-user distribution centers or CHP facilities will save significantly by eliminating a middleman exporter in the financial equation.

Partnering relationships with buyers or end-user distribution centers or CHP facilities will save significantly by providing an opportunity to own, lease or manage the fiber received to the aggregation yard. Gigajoule values can increase during natural drying periods with no costs.

11.) Replicate the Above.



E = MC³ ©

Financial Benefits from Acting Responsibly

Comparison of Commodities – MC & Gj Values

Analysis of Gigajoule Value Calculations

GJ/tonne = 19.2 - (0.2164*MC),

where MC is the moisture content in percent of total weight [27]

E=MC³© *v.* Wood Pellets

BDT-Gj				Gj		
19.2	-	(0.2164 * MC)	=	GJ		
	Given MC%	55	=	7.30	Gj/tonne	
	Given MC%	54	=	7.51	Gj/tonne	
	Given MC%	53	=	7.73	Gj/tonne	
	Given MC%	52	=	7.95	Gj/tonne	
	Given MC%	51	=	8.16	Gj/tonne	
	Given MC%	50	=	8.38	Gj/tonne	
	Given MC%	49	=	8.60	Gj/tonne	
	Given MC%	48	=	8.81	Gj/tonne	
	Given MC%	47	=	9.03	Gj/tonne	
	Given MC%	46	=	9.25	Gj/tonne	
	Given MC%	45	=	9.46	Gj/tonne	
	Given MC%	44	=	9.68	Gj/tonne	
	Given MC%	43	=	9.89	Gj/tonne	
	Given MC%	42	=	10.11	Gj/tonne	
	Given MC%	41	=	10.33	Gj/tonne	
	Given MC%	40	=	10.54	Gj/tonne	
	Given MC%	39	=	10.76	Gj/tonne	
	Given MC%	38	=	10.98	Gj/tonne	
	Given MC%	37	=	11.19	Gj/tonne	
	Given MC%	36	=	11.41	Gj/tonne	
	Given MC%	35	=	11.63	Gj/tonne	
	Given MC%	34	=	11.84	Gj/tonne	
	Given MC%	33	=	12.06	Gj/tonne	
	Given MC%	32	=	12.28	Gj/tonne	
	Given MC%	31	=	12.49	Gj/tonne	
	Given MC%	30	=	12.71	Gj/tonne	
	Given MC%	29	=	12.92	Gj/tonne	
	Given MC%	28	=	13.14	Gj/tonne	
	Given MC%	27	=	13.36	Gj/tonne	
	Given MC%	26	=	13.57	Gj/tonne	
	Given MC%	25	=	13.79	Gj/tonne	Targeted E=MC3©
	Given MC%	24	=	14.01	Gj/tonne	
	Given MC%	23	=	14.22	Gj/tonne	
	Given MC%	22	=	14.44	Gj/tonne	
	Given MC%	21	=	14.66	Gj/tonne	
	Given MC%	20	=	14.87	Gj/tonne	
	Given MC%	19	=	15.09	Gj/tonne	
	Given MC%	18	=	15.30	Gj/tonne	
	Given MC%	17	=	15.52	Gj/tonne	
	Given MC%	16	=	15.74	Gj/tonne	
	Given MC%	15	=	15.95	Gj/tonne	
	Given MC%	10	=	17.04	Gj/tonne	Industrial Wood Pellets
	Given MC%	5	=	18.12	Gj/tonne	
	Given MC%	0	=	19.20	Gj/tonne	

E = MC³©

Financial Benefits from Acting Responsibly

Comparative Adjustment of Volume to Balance Gj Purchase

Justification for Substitution or Inclusion of E=MC^3© Wood Chips in Place of Industrial Wood Pellets

Analysis conducted on the basis of a Gigajoule Purchase = to 1 Million MT of Wood Pellets = 17 million Gj

Industrial Wood Pellets	Forward	US $ FOB Mt	Gj/per-Mt	Per Gj US $	MMt Supply	Gj Equivalent	Annual Supply US$
	1Q22	$ 197.00	17.04	$ 11.56	1	17,036,000	$ 197,000,000
	2Q22	$ 187.00	17.04	$ 10.98	1	17,036,000	$ 187,000,000
	3Q22	$ 178.50	17.04	$ 10.48	1	17,036,000	$ 178,500,000
	4Q22	$ 180.50	17.04	$ 10.60	1	17,036,000	$ 180,500,000
Averaged - 22	2022	$ 185.75	17.04	$ 10.90	1	17,036,000	$ 185,750,000
	2023	**$ 172.50**	**17.04**	**$ 10.13**	**1**	**17,036,000**	**$ 172,500,000**
	2024	$ 173.00	17.04	$ 10.15	1	17,036,000	$ 173,000,000
Predicted	2025	$ 173.50	17.04	$ 10.18	1	17,036,000	$ 173,500,000

E=MC3©	Forward	US $ FOB Mt	Gj/per-Mt	Per Gj US $	MMt Supply	Gj Equivalent	Annual Supply US$
	1Q22	$ 124.95	13.79	$ 9.06	1	13,790,000	$ 124,955,000
	2Q22	$ 116.75	13.79	$ 8.47	1	13,790,000	$ 116,755,000
	3Q22	$ 107.85	13.79	$ 7.82	1	13,790,000	$ 107,855,000
	4Q22	$ 112.75	13.79	$ 8.18	1	13,790,000	$ 112,745,500
Averaged - 22	2022	$ 115.56	13.79	$ 8.38	1	13,790,000	$ 115,560,000
	2023	**$ 115.66**	**13.79**	**$ 8.39**	**1**	**13,790,000**	**$ 115,660,000**
	2024	$ 115.76	13.79	$ 8.39	1	13,790,000	$ 115,760,000
Predicted	2025	$ 115.86	13.79	$ 8.40	1	13,790,000	$ 115,860,000

Adjustment to Purchase equivalent Gigajoules to Wood Pellets

To provide an equivalent Gigajoules, the wood chip purchase volume is increased by 17.17%

Wood Pelets	**2023**	**$ 172.50**	**17.04**	**$ 10.13**	**1**	**17,036,000**	**$ 172,500,000**
E=MC3©	**2023**	**$ 115.66**	**13.79**	**$ 8.39**	**1**	**17,036,000**	**$ 142,884,972**

Adjusted Volume 1,171,681 Metric Tonnes Required E=MC3© Savings $ 29,615,028 17.17%

Source : Argus Biomass Markets Issue 21-50 Wednesday December 15, 2021 FOB Northeast USA

Gj Value Formula: GJ/tonne = 19.2 - (0.2164*MC), where MC is the moisture content in percent of total weight.

E = MC^3©

Financial Benefits from Acting Responsibly

Analysis of Savings to CHP Facility by Substitution

Justification for Substitution or Inclusion of E=MC^3© Wood Chips in Place of Industrial Wood Pellets

Analysis conducted on the basis of a Gigajoule Purchase = to 1 Million MT of Wood Pellets = 17 million Gj

	Forward	US $ FOB Mt	Gj/per-Mt	Per Gj US $	MMt Supply	Gj Equivalent	Annual Supply US$
Industrial Wood Pellets	1Q22	$ 197.00	17.04	$ 11.56	1	17,036,000	$ 197,000,000
	2Q22	$ 187.00	17.04	$ 10.98	1	17,036,000	$ 187,000,000
	3Q22	$ 178.50	17.04	$ 10.48	1	17,036,000	$ 178,500,000
	4Q22	$ 180.50	17.04	$ 10.60	1	17,036,000	$ 180,500,000
Averaged - 22	2022	$ 185.75	17.04	$ 10.90	1	17,036,000	$ 185,750,000
	2023	**$ 172.50**	**17.04**	**$ 10.13**	**1**	**17,036,000**	**$ 172,500,000**
	2024	$ 173.00	17.04	$ 10.15	1	17,036,000	$ 173,000,000
Predicted	2025	$ 173.50	17.04	$ 10.18	1	17,036,000	$ 173,500,000

	Forward	US $ FOB Mt	Gj/per-Mt	Per Gj US $	MMt Supply	Gj Equivalent	Annual Supply US$	
E=MC3©	1Q22	$ 124.95	13.79	$ 9.06	1	13,790,000	$ 124,955,000	
	2Q22	$ 116.75	13.79	$ 8.47	1	13,790,000	$ 116,755,000	
	3Q22	$ 107.85	13.79	$ 7.82	1	13,790,000	$ 107,855,000	
	4Q22	$ 112.75	13.79	$ 8.18	1	13,790,000	$ 112,745,500	
Averaged - 22	2022	$ 115.56	13.79	$ 8.38	1	13,790,000	$ 115,560,000	
	2023	**$ 115.66**	**13.79**	**$ 8.39**	**1**	**13,790,000**	**$ 115,660,000**	**$ 56,840,000**
	2024	$ 115.76	13.79	$ 8.39	1	13,790,000	$ 115,760,000	
Predicted	2025	$ 115.86	13.79	$ 8.40	1	13,790,000	$ 115,860,000	

Adjustment to Purchase equivalent Gigajoules to Wood Pellets

To provide an equivalent Gigajoules, the wood chip purchase volume is increased by 32.95%

Wood Pelets	**2023**	**$ 172.50**	**17.04**	**$ 10.13**	**1**	**17,036,000**	**$ 172,500,000**	*Difference*
E=MC3©	**2023**	**$ 115.66**	**13.79**	**$ 8.39**	**1**	**13,790,000**	**$ 115,660,000**	**32.95%**
Added Mt Volume Required to Equal Gj		**235,388**		**$ 8.39**	**1,235,388**	**3,246,000**	**$ 10,361,492**	
					Adjustment	**17,036,000**	**126,021,492**	**26.94% Savings**

17.04 Wood Pellets **13.79** **E=MC3©** **Adjustment 23.54%**

Adjusted Mt Volume Required		**Previous**	**1,000,000**			
Adjusted Volume	**1,329,507**	**Metric Tonnes Required**	**E=MC3©**	**Savings**	**$ 56,840,000**	**32.95%**

Here, a CHP facility can reduce its fiber supply costs by 32.95% by a total substitution of wood pellets as a supply commodity with E=MC3© however, the suggestion is to substitute and or complement the traditional utilization of wood pellets with a marginal influx of E=MC3© as demonstrated herein.

	Commodity	*% Adjusted*	*Mt Required*	*Original Gj*	*Adjusted Gj*	*Gj USD $ FOB*	*Delivered USD $*
Suggested Modification	**ood Pellets**	**35%**	**650,000**	**17,036,000**	**11,073,400**	**$ 10.13**	**$ 112,125,000**
	E=MC3©		**432,386**		**5,962,600**	**$ 8.39**	**$ 50,009,740**
			1,082,386		**17,036,000**		**$ 162,134,740**
						Original Pellet USD $	**$ 172,500,000**
					CHP Facility Savings with Substitution		**$ 10,365,260**
						Savings %	**6.01%**

Source: Argus Biomass Markets Issue 21-50 Wednesday December 15, 2021 FOB Northeast USA

Gj Value Formula: GJ/tonne = 19.2 - (0.2164*MC), where MC is the moisture content in percent of total weight.

The Parameters: For Analysis of Savings made possible by substitution or utilizing a partial substitution of E=MC3© Wood Chips in place of industrial wood pellets. This analysis starts with the values attributed to the purchase and supply of 1-million metric tonnes of industrial wood pellets with a Gj value of $17.04 per Mt. for a Gj contract purchase of 17,036,00 Gj delivered. Using values established herein, the Gj value per Mt for E=MC3© Wood Chips is $13.79 Gj/Mt. To increase the Gj value to an equivalent of wood pellets we must add an additional 23.54% to the base Gj of $13.79 to achieve $17.04 per Gj.

Here we adjust the volume of wood pellet consumption by 35% and remain with a total ocean freight volume of 1,082,386 Mt afloat. This adjustment lowers the overall cost to the CHP facility from $172,500,000 to about $162,134,740 for a savings of $10,365,260 or about 6.01%. The total Gj purchase volume remains the same.

By reducing the Mt volume by *35%* *fiber volume decreases by* *840,000* *US Ton of fiber and annual acres saved =* *6,388*

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FORWARD-LOOKING AND PREDICTIVE STATEMENTS

The representations depicted herein are based on exhaustive, multi-year cross industry disciplined research and development, primarily related to woody biomass as a sustainable source of renewable energy fiber for use in co-generation CHP facilities and in stand-alone power plants intended to rely only on biomass wood chips.

All predictions and statements, other than cited commentary derived of published or historical facts, included in this presentation that address activities, events or developments that we expect, believe or anticipate will or may occur in the future are forward-looking statements. The words "may," "estimated," "believe," "expect," "will," "anticipate," "plan," "intend," "foresee," "should," "would," "could," or other similar expressions are intended to identify forward-looking statements, which are generally predictive but, not historical in nature.

The intent here is to combine those statements with reasoned prediction – helpful in a broad, macro sense, that can point to potential alternatives to traditional thinking and allow one to fulfill market demand, address climate change issues, reinvigorate forest industry revenue, enhance local and international economies and build enduring strategic alliances globally.

THANK YOU FOR YOUR TIME AND INTEREST

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