

BIOENERGY 2010

warming to wood energy



JOINTLY PRESENTED BY:



Funded by the Forest Service of the Department of Agriculture, Fisheries and Food under the National Development Plan 2007 – 2013.



The Sustainable Energy Authority of Ireland is financed by Ireland's EU Structural Funds Programme co-funded by the Irish Government and the European Union.

Two applications to calculate bioenergy costs

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Problems

- The worst problem with bioenergy is that the moisture content varies, which make them difficult to compare to other fuels
- Conversion factors are not always easy to find and to apply
- Often more than one conversion factor has to be applied

Questions

- How much alternative fuel do I need to replace a certain amount of primary fuel
- What is the potential savings in changing to another fuel
- What is the simple pay back time on my investment?
- What is the cost to produce and deliver wood fuel and do I make a profit

Answers Conversion 1

The Fuel Conversion Calculator:

- Click on your present fuel
- Enter the amount used
- Enter the price
- Click on your future fuel
- Enter the price
- Enter the cost of the future boiler

Answers Conversion 2

Based on this information the application will calculate

- The present energy consumption in GJ and total cost
- The amount of alternative fuel to be used
- The total cost of the alternative fuel
- The possible savings
- A simple pay back period

Fuel Conversion Cost Comparisons

Print to File

Help



Current Energy Source

- Light Oil
- Natural Gas
- Electricity
- LPG Propane
- LPG Butane
- Coal Anthracite
- Peat Briquettes
- Milled Peat
- Sod Peat
- Wood Chips
- Wood Pellets
- Wood Briquettes
- Firewood (H'wd)
- Firewood (S'wd)
- Torrefied Pellets

Current System

Annual Consumption (ton)	<input type="text" value="6.5"/>	Units <input checked="" type="radio"/> ton <input type="radio"/> m ³	Fuel Cost (\$ per unit)	<input type="text" value="400"/>
Boiler Efficiency (%)	<input type="text" value="85"/>		Calculated Annual Cost (\$)	<input type="text" value="2,600"/>
Calculated Energy Consumption (GJ)	<input type="text" value="190.5"/>			

Future Energy Source

- Wood Chips
- Wood Pellets
- Wood Briquettes
- Firewood (H'wd)
- Firewood (S'wd)
- Torrefied Pellets
- Light Oil
- Natural Gas
- Electricity
- LPG Propane
- LPG Butane
- Coal Anthracite
- Peat Briquettes
- Milled Peat
- Sod Peat

Future System

Expected Annual Consumption (ton)	<input type="text" value="22.8"/>	Units <input checked="" type="radio"/> ton <input type="radio"/> m ³ lv	<input type="radio"/> GJ <input type="radio"/> kWh	Fuel Cost (\$ per ton)	<input type="text" value="35"/>
Boiler Efficiency (%)	<input type="text" value="75"/>	Moisture Content (%)	<input type="text" value="45"/>	Calculated Annual Saving (\$)	<input type="text" value="1,802"/>
New Boiler Cost (\$)	<input type="text" value="5000"/>	Simple Payback Period (years)	<input type="text" value="2.8"/>	Calculated Annual Cost (\$)	<input type="text" value="798"/>

Disclaimer

View and Update Conversion Factors

Change Currency Symbol

Calculate

Reset

Exit

Delivered cost for wood chips 1

This is a more complicated application

Questions need to be answered before the calculation can be carried out:

- Location of the fuel
- Tree species (basic density)
- Conversion factor between m^3 solid and m^3 loose volume of chips
- What is the purchase price of the wood

Delivered cost of wood chips 2

- What is the moisture content at different stages of the delivery chain
- What is the ash content
- What are harvesting, forwarding and chipping costs
- What is the transport cost per hour
- What is the transport distance

Delivered cost wood chips 3

- What is the volume being transported
- What is method of unloading
- What is the storage period in months
- What is the interest rate per month
- What is the sales price per unit

Based on this information the sales price and the processing costs are calculated and a profit or loss

Delivered Woodfuel Sales Value

Print to File

Help



Disclaimer

Purchase Type

Standing in Forest
 Roundwood at Roadside
 Roundwood at Yard
 Chips in Forest

Purchase Price (£/ton)

Units

m² s ton

Wood Data

Species

Default BD

Species	Basic Density (kg dry matter per m ² s)
<input type="radio"/> Generic Softwood	395
<input checked="" type="radio"/> Spruce	380
<input type="radio"/> Pine	420
<input type="radio"/> Generic Hardwood	500
<input type="radio"/> Eucalypt	380
<input type="radio"/> Poplar	380
<input type="radio"/> Own Figure	

Conversion Factor m² lv / m² s

Ash Content (%)

Measured

Standard

Moisture Content (%)

Roundwood in Forest

Energy Content

GJ/ton	MWh/ton
<input type="text" value="7.30"/>	<input type="text" value="2.03"/>

Units per Ton

m ² s	m ² lv
<input type="text" value="1.18"/>	<input type="text" value="3.32"/>

Chips in Forest

Energy Content

GJ/ton	MWh/ton
<input type="text" value="9.46"/>	<input type="text" value="2.63"/>

Units per ton

m ² s	m ² lv
<input type="text" value="1.45"/>	<input type="text" value="4.05"/>

Chips at Yard

Energy Content

GJ/ton	MWh/ton
<input type="text" value="12.71"/>	<input type="text" value="3.53"/>

Units per Ton

m ² s	m ² lv
<input type="text" value="1.84"/>	<input type="text" value="5.16"/>

Change Currency Symbol

Harvesting, Chipping and Storage Data

Harvesting Cost (£/t)	Forwarding Cost (£/t)
<input type="text" value="7"/>	<input type="text" value="10"/>
Chipping Cost in Forest (£/t)	Chipping Cost at Yard (£/t)
<input type="text" value=""/>	<input type="text" value="8"/>
Transport and Chipping Losses (%)	Storage Period (months)
<input type="text" value="2"/>	<input type="text" value="5"/>

Units

m² s m² lv ton

Transport Data

Hourly Truck Cost (£/hr)

Roundwood	Chip
<input type="text" value="90"/>	<input type="text" value="85"/>

Transport Distance (km)

Roundwood	Chip
<input type="text" value="15"/>	<input type="text" value="30"/>

Load Size (m²)

Roundwood (m ² s)	Chip (m ² lv)
<input type="text" value="30"/>	<input type="text" value="70"/>

Roundwood Load Weight (kg)

Chip Load Weight (kg)

Chip Unloading Method (min/load)

Tipping Blowing Other

Price, Profit and Interest Data

Sales Price

£ per unit

€/GJ €/MWh

Profit (%)

Interest (% per month)

Financial Results

	£ per ton
Sales Price	88.96
Purchase Cost	15.31
Harvesting Cost	7.14
Forwarding Cost	10.20
Transport Cost: R'wood	8.59
Transport Cost: Chip	17.32
Chipping Cost	8.16
Storage Cost	1.67
Supplier's Profit	2.74
Total Cost	71.13
Net Value (£ per ton)	17.82

Units

€ per Chip Truck Load € per ton
 € per Roundwood Truck Load € per m² s

Who are the applications aimed at?

- The fuel comparison calculator is aimed at all potential consumers of bioenergy, sales people of boiler systems, anyone with an interest in bioenergy
- The fuel cost calculator is aimed at suppliers of bioenergy fuels such as forestry contractors, sawmills, wood working industries, fuel suppliers

Details 1

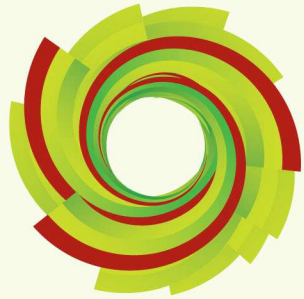
- The applications allow for many different units to be used such as tonne, m³ solid, m³ loose volume, GJ, MWh, nm³, bag, big bag
- The currency symbol can be changed
- There are help functions
- There are default values, which can be changed and stored or reset

Details 2

- The results of a calculation can be stored
- The results can be printed

Where are the applications to be found ?

- For residents of Ireland and Northern Ireland the applications can be ordered via www.woodenergy.ie as a part of the advisory service
- one has to require a CD with the programs on it, which will include a installer for each programme
- There is a small handling cost of €10
- People outside the Island are referred to the author



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