An investigation of the economic potential of Short Rotation Forestry for fibre and fuel in Ireland

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What is Short Rotation Forestry (SRF)?

- Single trees of fast growing species.
- Reduced rotation length compared to conventional forestry.
- Primarily for the production of biomass or fibre.
- Between short rotation coppice systems and conventional forestry.
Why should we do Short Rotation Forestry?

- Ireland’s renewable energy targets 16% by 2020 (2009/28/EC).
  (Renewable energy was 7.8% of Gross Final Energy Consumption in 2013)
  
  SRF → Assist in achieving renewable energy targets.

- Wood energy supply gap likely to be 1-1.25 million m³ per annum*.

<table>
<thead>
<tr>
<th>Year</th>
<th>Demand (million m³)</th>
<th>Available (million m³)</th>
<th>Gap (million m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1.59</td>
<td>1.07</td>
<td>0.52</td>
</tr>
<tr>
<td>2028</td>
<td>3.08</td>
<td>1.75</td>
<td>1.33</td>
</tr>
</tbody>
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SRF → Reduce the predicted shortfall in supply of timber for biomass

Forest policy

Already promoting afforestation for fuel and fibre.

Irish Forestry Programme 2014-2020. Grant and Premium Category: Forestry for Fibre*

Eligible species:
• Italian alder
• Hybrid aspen
• Eucalyptus
• Poplar

Research question:
What is the financial value of Short Rotation Forestry in Ireland?
Objectives:

1. To develop a **unit conversion tool** to quantify wood resources for different markets.

2. To assess **the market requirements** to fibre and energy from SRF plantations in Ireland.

3. To explore how to **optimise** the value of the SRF plantations in Ireland.
Conceptual framework

Forest stand data → Unit conversion tool → Value optimisation Software: VALMAX → Potential financial value of Short Rotation Forestry

Market data
Stands data collection

Detailed assessments by:

• Measuring volumes
• Taking destructive samples from target trees to determine tree biomass parameters:
  
  o Biomass expansion factors
  o Moisture content
  o Basic density
  o Ash content
  o Calorific value
Market requirements assessment

Data collection of competing markets:

• **Price** paying potential
• Allowable **material specifications** of different tree partition assortments
Unit conversion tool
How can we quantify wood resources for different markets?

Solid volume: m\(^3\)

Bulk volume: m\(^3\)
Dry weight: Oven dry tonnes
Calorific value: GJ Kg\(^{-1}\), MWh

Weight: Green tonnes

BulK volume: m\(^3\)
Dry weight: Oven dry tonnes
Value optimisation

Value optimisation Software: VALMAX*

- Optimal log-making algorithm
- Optimally allocate wood products from forest to market

Value optimisation

Value optimisation Software: VALMAX (Value Maximisation)

**Bucking optimisation**: producing logs from tree stems aiming to get the maximum value of them.

**Bucking to value**:
- **Stem level** → maximise the value of each individual tree.
- Best situation for the **forest owner** → market will take the amount of each log type produced whatever is the volume of each.

Potential financial value of Short Rotation Forestry
Thank you for your attention