



Northern Periphery and
Arctic Programme
2014-2020



European Union
European Regional
Development Fund

Developments in seaweed drying

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Oilthigh na Gàidhealtachd
agus nan Eilean
Colaisde a' Chaisteil



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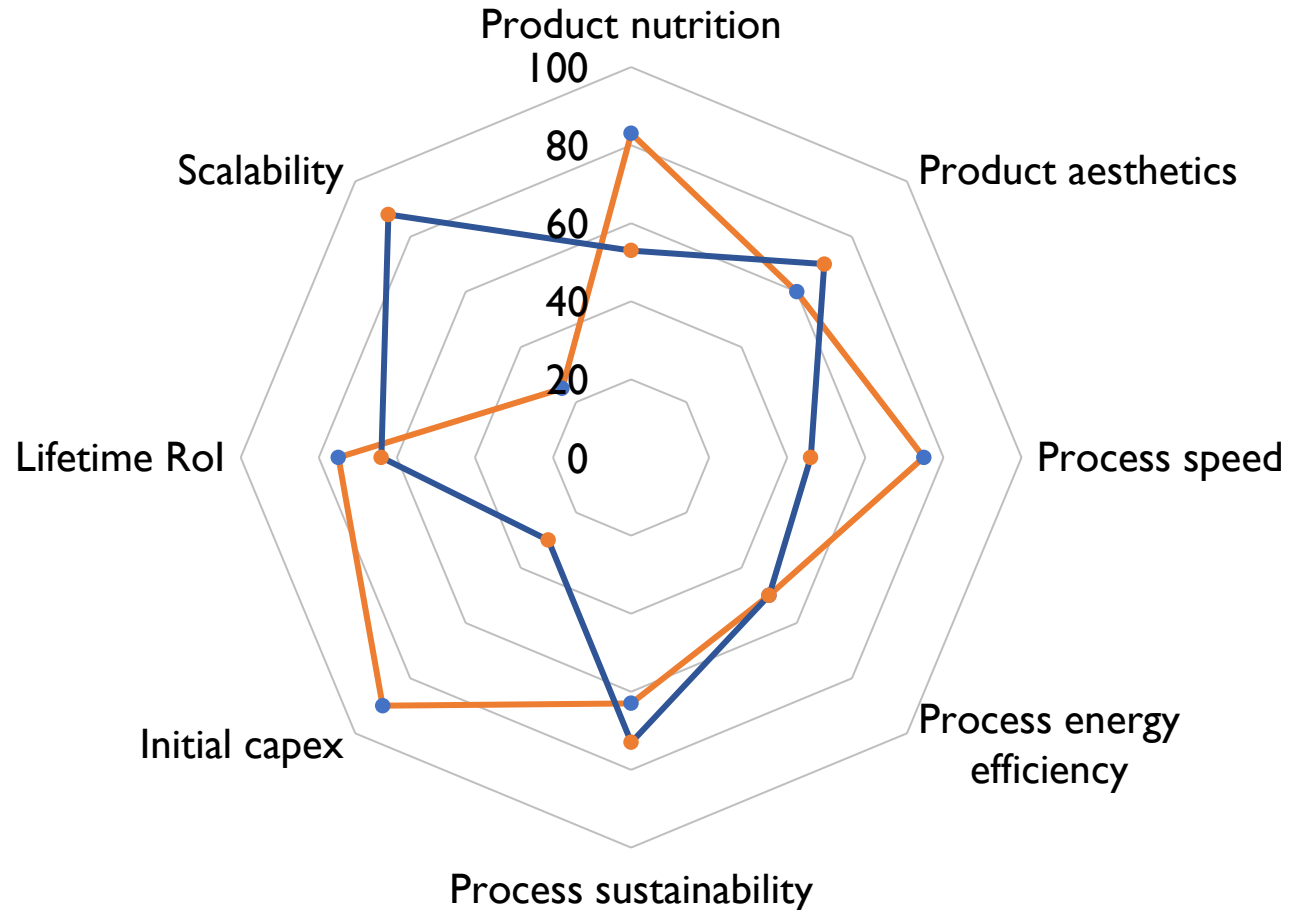
Oilthigh na Gàidhealtachd
agus nan Eilean
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Outline

1. “Optimal” seaweed drying (1 min)
What is optimal seaweed drying?
2. Natural convection seaweed drying kinetics (2 min)
How should seaweed be dried optimally with natural convection?
3. Seaweed drying systems (1 min)
What is the optimal energy system for seaweed drying?

I. “Optimal” seaweed drying

NB: For discussion of optimisation only (not real figures).



2. Seaweed drying kinetics

Alaria esculenta

winged kelp
bladderlocks
lair



Palmaria palmata

dulse
dillisk

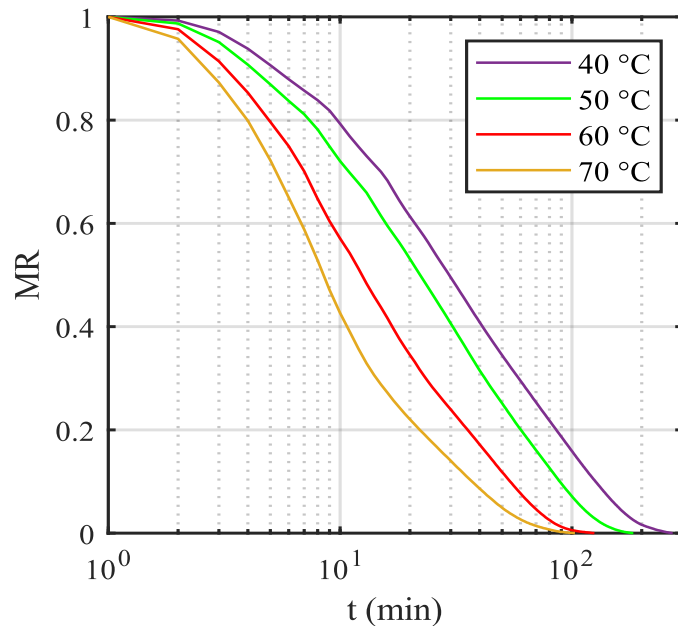


2. Seaweed drying kinetics

- How does air temperature affect drying time in natural convective drying?

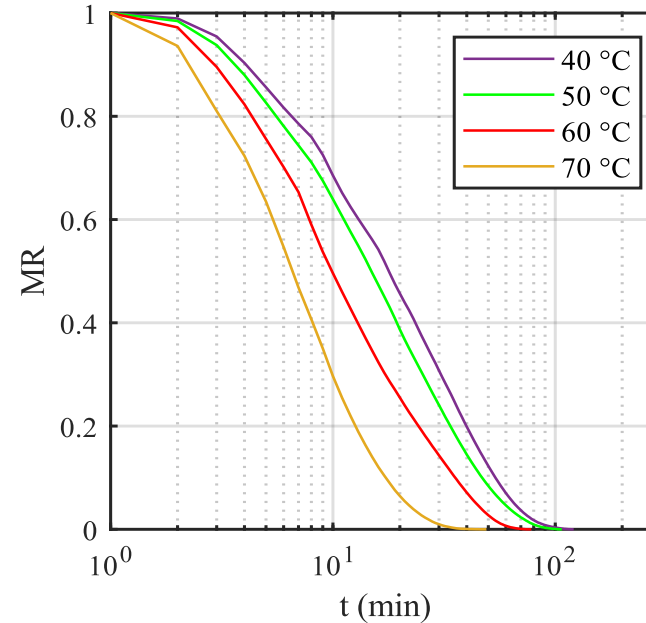
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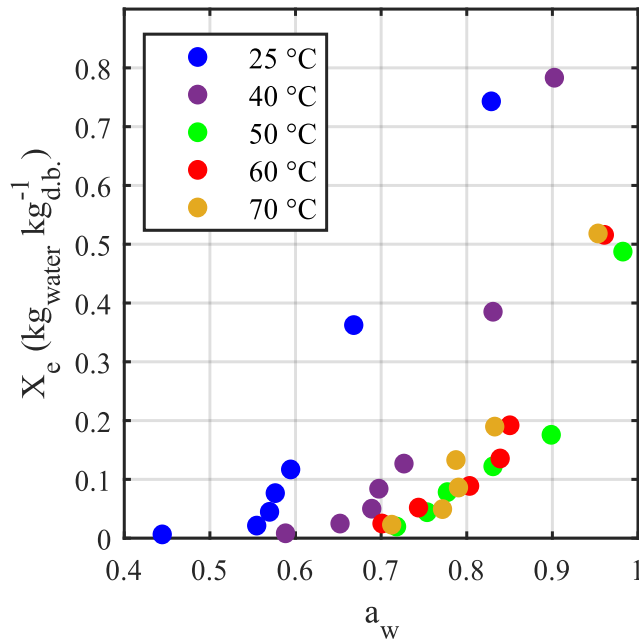


2. Seaweed drying kinetics

- How dry does the dry seaweed need to be when stored?

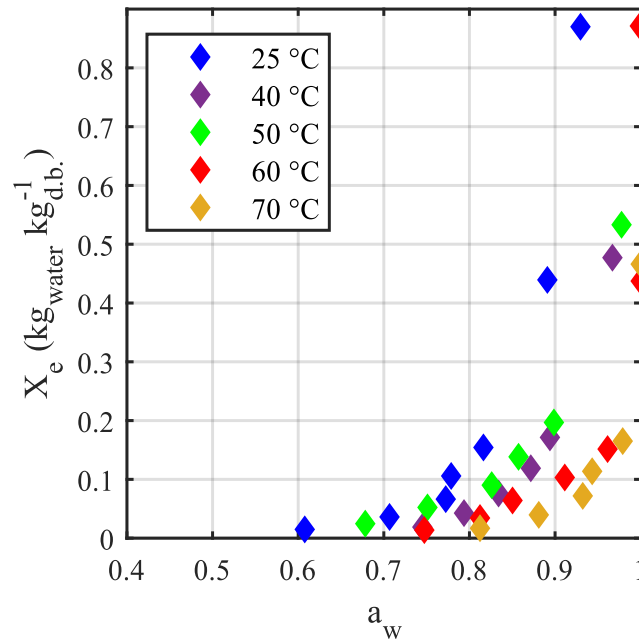
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3. Seaweed drying systems

What is the optimal energy system for seaweed drying?

- Seaweed drying using wind as the primary energy source is very plausible in the NPA region due to:
 - Good water characteristics;
 - Excellent mean windspeeds.
- For an off-grid system, tradeoffs exist between turbine size, battery capacity, and acceptable level of “waste”.
- Order-of-magnitude reduction in power requirement if energy capture drying processes are introduced.



For more information:

1. Bartle, R.S., Macleod, A. 2020. "The effect of natural convection air temperature on drying kinetics and desorption isotherms of *alaria esculenta* and *palmaria palmata*. Submitted to *International Journal of Applied Phycology*.
2. Bartle, R.S., Macleod, A. 2020. "Wind power systems for commercial seaweed drying". *Arctic Frontiers*. Tromsø, Norway, 26-30 Jan 2020.

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