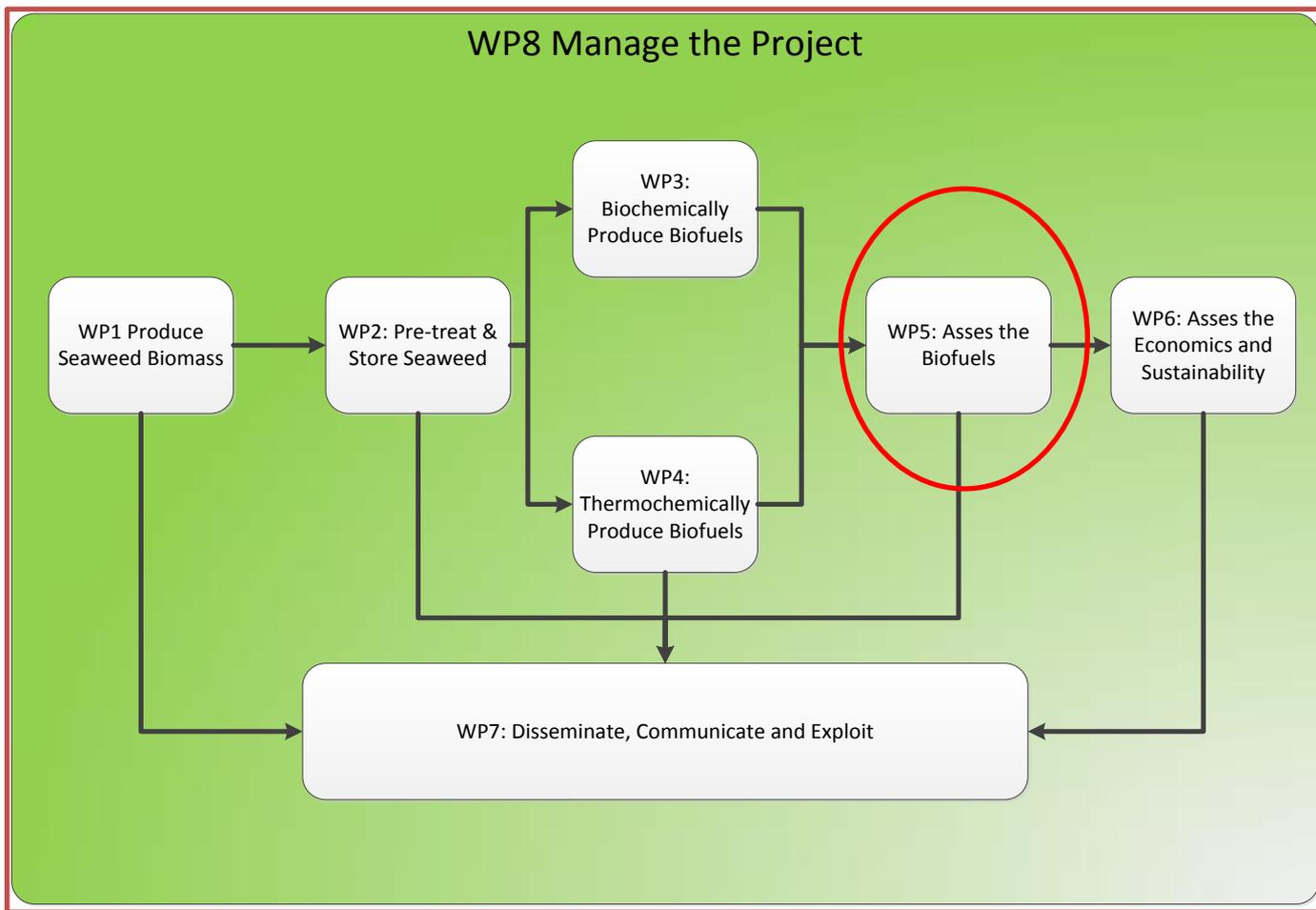


# WP5: Fuel suitability and by-product application tests

1<sup>st</sup> Progress Meeting, June 28/29,  
2016, Reykjavik, Iceland



# WP-5 flow



# Objectives

- To determine the suitability of the produced fuels in the use of combustion engines
- To perform a combustion engine test with selected fuels from WP 3 and 4
- To assess the use of the residues from the fractionation and fermentation processes, specifically the protein and the mineral fractions

# Partner roles

- DTI: Fuels suitability (Advisory Board)
- ECN: Minerals
- DLO: Protein and minerals
- 28 PM
- M20-42

# Tasks

Task	Partner
Fuel suitability tests: screening test and engine test (biofuel blend)	DTI
Assesment of the minerals	ECN
Assesment and upgrading of Proteins	DLO

# Fuel Tests Ethanol

- Ethanol test
- Type: Spark ignition test, 1.2l turbocharged GDI Engine
- Blend:
- We will test at 10%, 20%, 85%, 100% by volume. Amount: 200l (A standard 200-litre (55 US or 44 imp gal) drum)
- Test procedure:
- During test we will focus on measurement of particulate, black carbon, aldehydes, ketones, polycyclic aromatic HC, secondary organic aerosols from heavy HC and cold start properties. Using a pressure probe, we will analyse indicated efficiency.
- We envision the drivecycles cycles performed will be: U.S. FTP75, Europe NEDC Japan 10.15 and ece r83 type VI (low ambient temperature, CO and HC after cold start.)

# Butanol Fuel Test

- N-Butanol test
- Type: Spark ignition test, 1.2l Turbocharged GDI Engine
- Blend:
- We will test at 10%, 20%, 85%, 100% by volume. Amount: 200l (A standard 200-litre (55 US or 44 imp gal) drum)
- Test procedure:
- During test we will focus on measurement of particulate, black carbon, aldehydes, ketones, polycyclic aromatic HC, secondary organic aerosols from heavy HC and cold start properties. Using a pressure probe, we will analyse indicated efficiency.
- We envision the drivecycles cycles performed will be: U.S. FTP75, Europe NEDC Japan 10.15 and ece r83 type VI (low ambient temperature, CO and HC after cold start.)

# “Ether” (Furanic) Test

- Ether test
- Type: Compression/spark ignition test, engine TBD
- Blend:
- We will regard this as an additive, 100ppm to 1% by volume
- Amount: 2l
- Test procedure:
- During test we will focus on measurement of particulate, black carbon, aldehydes, ketones, polycyclic aromatic HC, secondary organic aerosols from heavy HC and cold start properties. Using a pressure probe, we will analyse indicated efficiency and ignition delay. All depending on the properties of the additive.
- We envision the drivecycles cycles performed will be: U.S. FTP75, Europe NEDC Japan 10.15 and ece r83 type VI (low ambient temperature, CO and HC after cold start.)

# Next Steps

- Estimate what it would take to produce 20 l. of alcohols & selected furanic.
- Estimate what it would take to produce 2 l. of all furanics.
- Plan the “scale-up” and check equipment
- Get back to me on September 1, 2016
- Get going on the advisory board
  - Target date, Jan 1, 2017

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