

Micro and Macro Algae Based Products and Services in the Nordic Marketing System

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Global outlook for algae products



- Global algae products market is projected to be around \$4.0 billion in 2018 and grow to \$5.2 billion by 2023.(1).
- Algae protein and the nutritional and dietary supplement segment have the highest growth rate.(1)
- Megatrends: Veganism, sustainability, health...
- Mega challenges: Climate change, resource depletion, world hunger, water crisis...

Algae is our "green future"



- "Algae is the most efficient group of organisms on Earth turning CO₂, sunlight, and water into densely nutritious food for all living animals for more than 3.5 billion years." (Holm, Co-founder Nonfood)
- "As consumers continue to demand more sustainable and nutritious dietary options, algae is poised to play a larger role in everyday health." (White, Qualitas health)
- "The future of all materials, is likely biobased, from alternatives to petroleum-based products that can all be brewed, fermented through to better materials" (Bethencourt, Babel ventures)
- Algiknit, a biomaterials start-up, wants to push the fashion industry into the circular economy with compostable, durable, kelp-driven yarns.

<https://www.babel.ventures/ryanbethencourt>

<https://www.algiknit.com/>

<https://www.forbes.com/sites/jenniferhicks/2018/06/15/see-how-algae-could-change-our-world/#34b12dc93e46>

<https://eatnonfood.com/>

<https://www.qualitas-health.com/>

Some algae products

“Almost anything you can make from petroleum, you can also make from renewable algae resources!”

Cosmetics

- Creams, masks, shampoos, toothpaste etc.

Fuels

- Biogas
- Biodiesel

“Eco services”

- Fertilizers: Algae contain minerals and nutrients and support nitrogen fixation and phosphate solubilization
- Water purifier: Battle eutrophication, clean waste water

Chemicals

- Abrasives (water filtration systems, organic pest controls)
- Colour pigments

Food

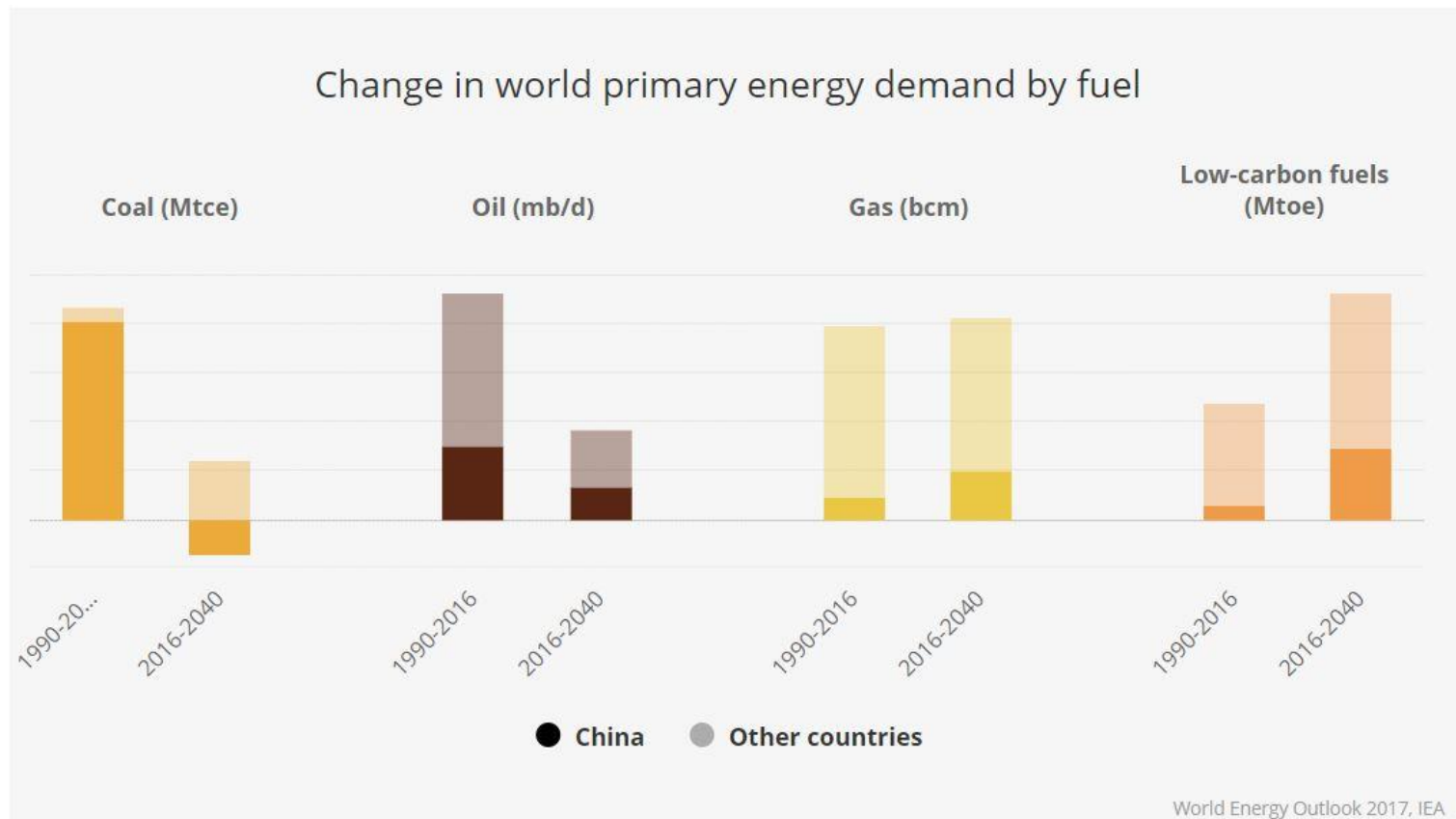
- Additives: Carrageenan and algin as thickeners (ice cream, yougurth...)
- Supplement: Algae-based omega-3 and omega-7, high levels of protein (Vegan)!
- Spirulina, Chlorella
- Sushi, crisps, seasalad etc.
- Flavourings

UN 2030 Agenda for Sustainable Development



development.un.org/sdg2

Global Outlook Gas and Biofuels

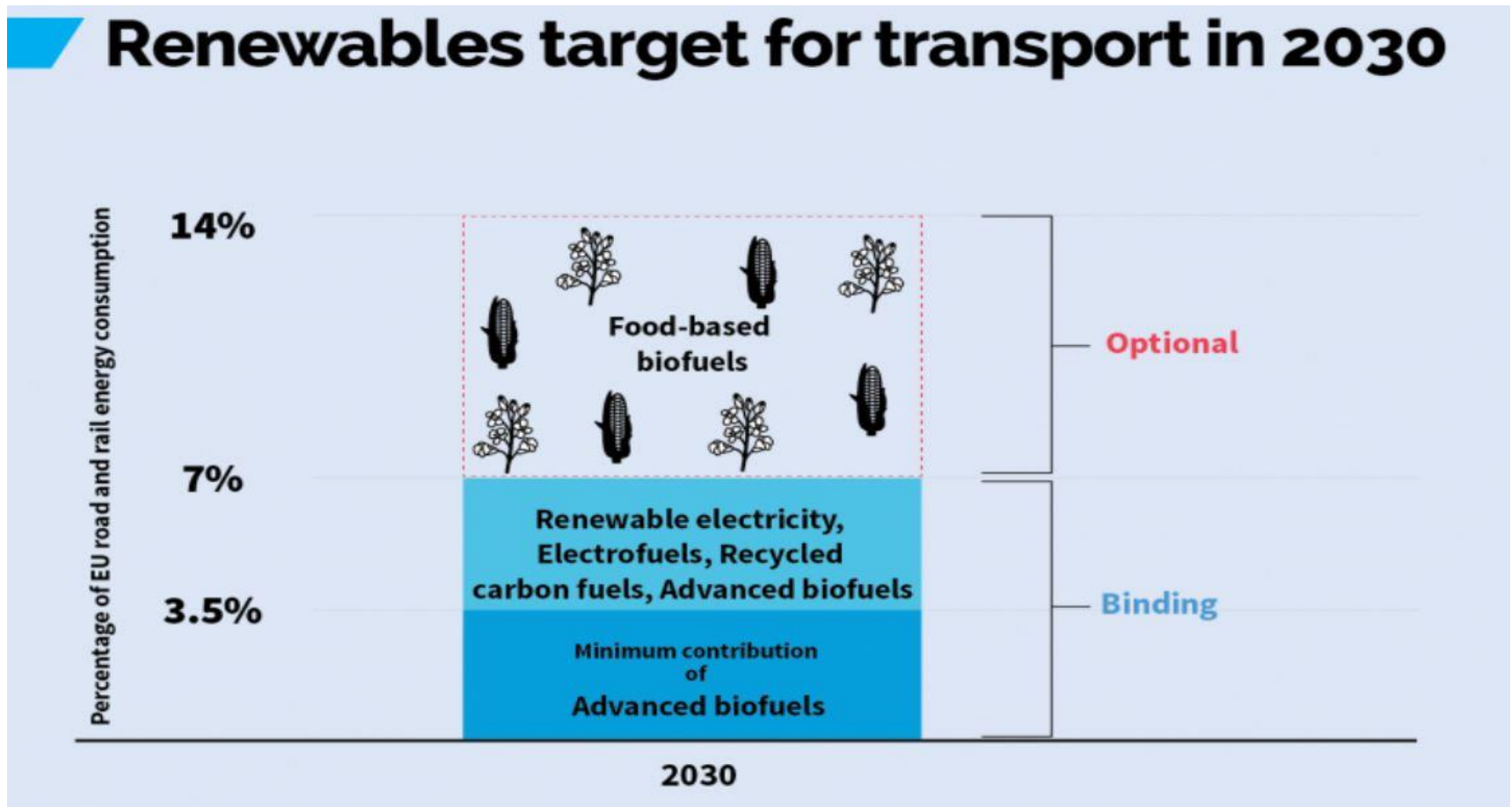


Biogas and Biodiesel in the EU



- Biogas production in the EU is currently 625 PJ (2014 data), accounting for 7.6% of the total primary production from RES.
- The potential biogas production for the EU28 in 2030 is calculated to be between 28.8 and 40.2 Mtoe (of 1,436 Mtoe total primary EU energy consumption). This is about 1.9 and 2.7 times larger than the biogas production in 2014 (Eurostat data).
- By 2020, the EU aims to have 10% of the transport fuel of every EU country come from renewable sources such as biofuels. Fuel suppliers are also required to reduce the greenhouse gas intensity of the EU fuel mix by 6% by 2020 in comparison to 2010.

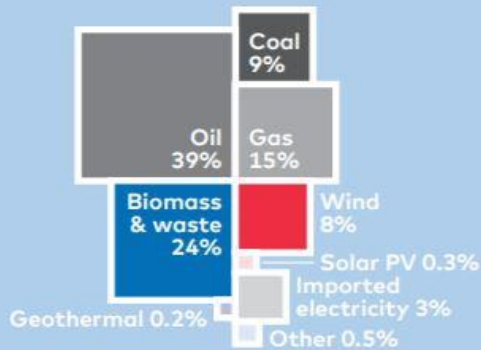
EU Target of 14% renewables in transport by 2030



Nordic energy



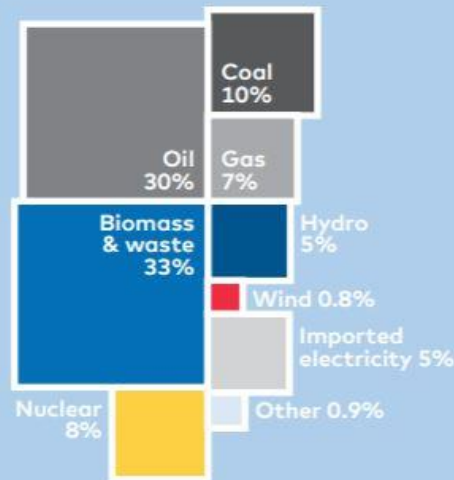
Denmark
13 Mtoe in 2015



Denmark has little energy intensive industry relative to other Nordic countries. Combined Heat and Power together with district heating provides much of the country's heat supply, often fired with biomass from agriculture. Wind power alone covered 43% of electricity demand in 2017.



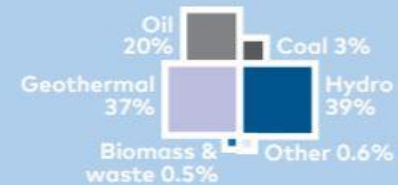
Finland
24 Mtoe in 2015



Finland's high share of forest-based bioenergy stems from its forest and paper industries. Combined Heat and Power and district heating are both central in the energy system.

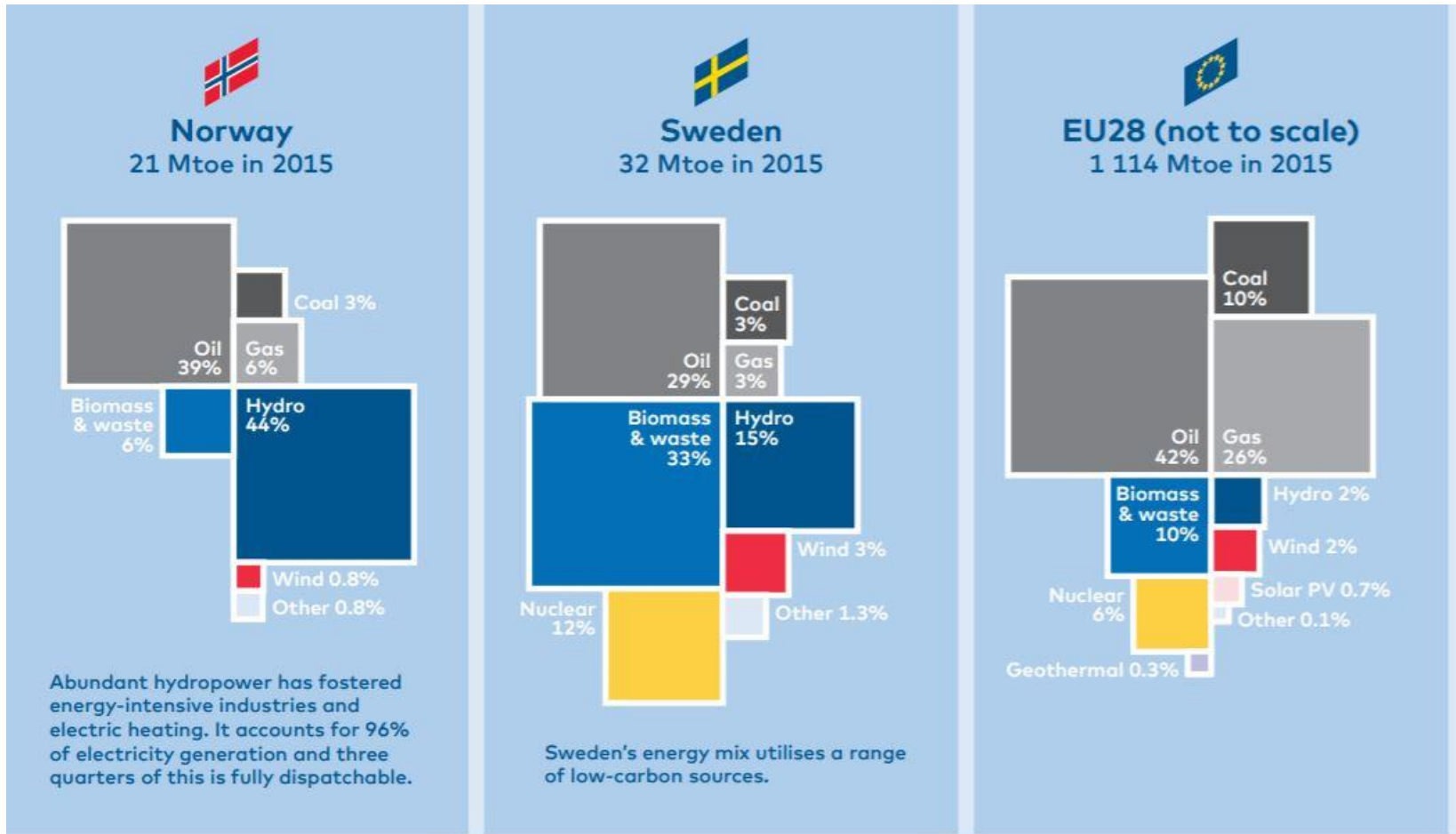


Iceland
2.9 Mtoe in 2015



Iceland's vast geothermal energy resources cover most of the country's heat demand, distributed via district heating. Much of the tapped hydropower potential supplies energy intensive industries – traditionally aluminium smelting, with recent additions of data centres and even bitcoin mining. As Iceland is not connected to the European grid, industrial energy use enables the embodied export of renewable energy as products and services, displacing more carbon-intensive operations elsewhere.

Nordic energy



Climate targets and GHG emissions

"Denmark is to be independent of fossil fuels by 2050"



"GHG emissions reduced in Finland by at least 80% by 2050"



"Reduction of Iceland's net GHG emissions by 50-75% by 2050"



"Norway will be carbon neutral in 2050"



"Sweden to have no net emissions of GHG into the atmosphere by 2045"



- Total GHG emissions (excluding LULUCF)
- Energy supply (electricity, heat, fuel extraction & refining)
- Manufacturing industry (including process emissions)
- Transport

Source: UNFCCC, national governments (targets). Note: Norway's increase in energy supply emissions is due to oil and gas extraction. Iceland's target is currently under revision, its energy supply emissions are insignificant and not shown, and its increase in industrial emissions is due to aluminium production. Fluctuations in energy supply emissions in Denmark, Finland and Sweden are primarily due to thermal generation providing seasonal balancing to hydropower (wet/dry years) and heat demand (cold/warm winters).

Nordic Food



- A survey from Ernst & Young found that 24 percent of Nordic consumers predict they will eat less meat in the next five years, primarily due to health and environmental reasons, and 34 percent of the Nordic consumers indicated that they would eat more vegetarian food.(1)

Solutions Menu - A Nordic guide to sustainable food policy

- “For the first time, the most innovative food policy solutions in the Nordic Region have been brought together in a single document. The Solutions Menu includes 24 policies that aim to change food consumption and intends to inspire new and robust policy responses to the societal and environmental challenges caused by our current food systems.” (2)

(1) <https://euobserver.com/nordic/142318>

(2) <http://norden.diva-portal.org/smash/record.jsf?pid=diva2%3A1214792&dswid=-2368>

Nordic algae services?



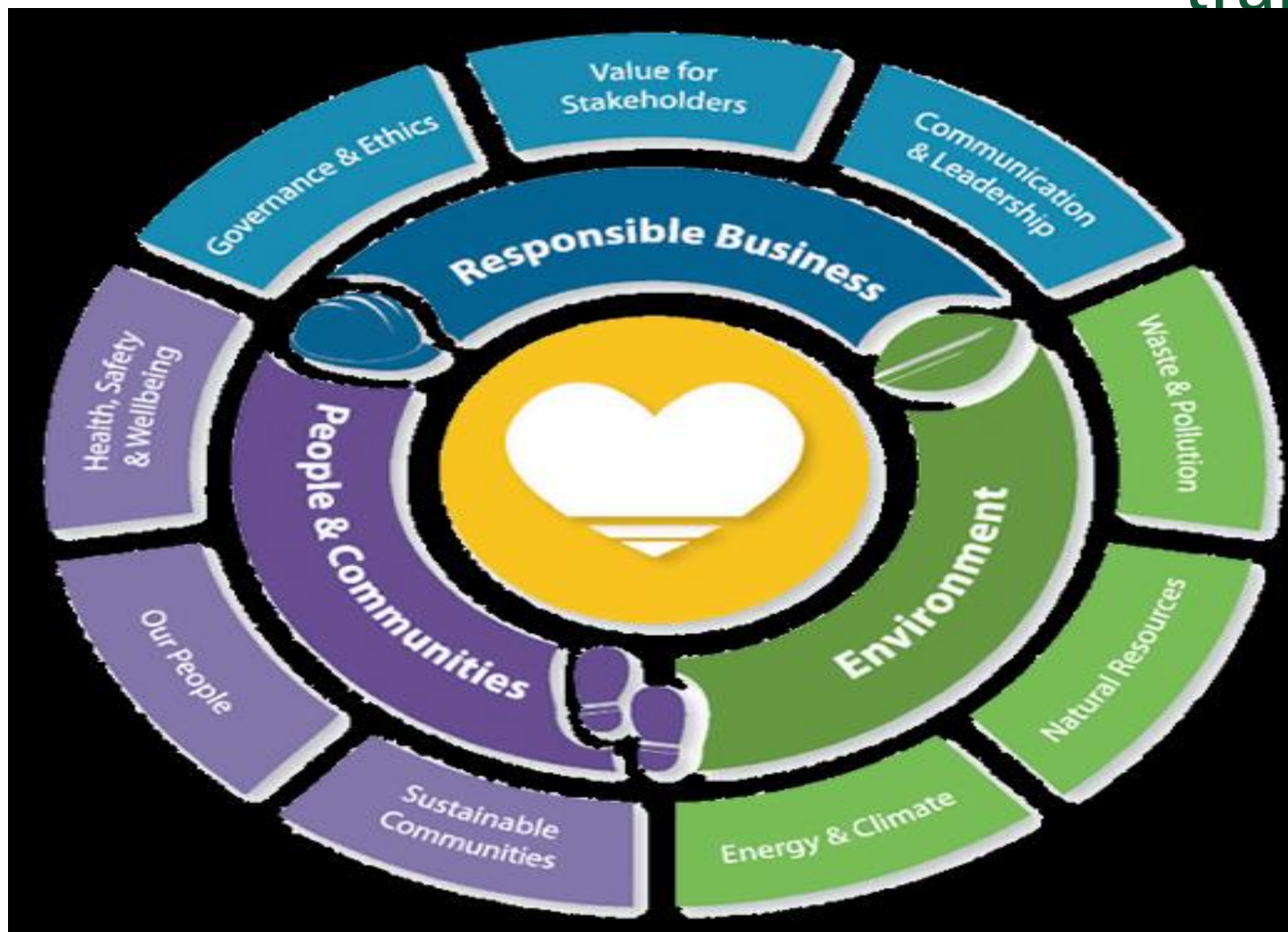
“The age of everything-as-a-service is upon us”

- The world is moving from products to services, subscriptions are exploding because millions of digital customers are increasingly favoring access over ownership. Most companies are still built to sell products. (Tien Tzuo 2018)

“Forget about business as usual”!

- Worth keeping in mind: Eco- services, Ecosystem services - are the direct and indirect contributions of ecosystems to human well-being. They support directly or indirectly our survival and quality of life.

Sustainable Business Models

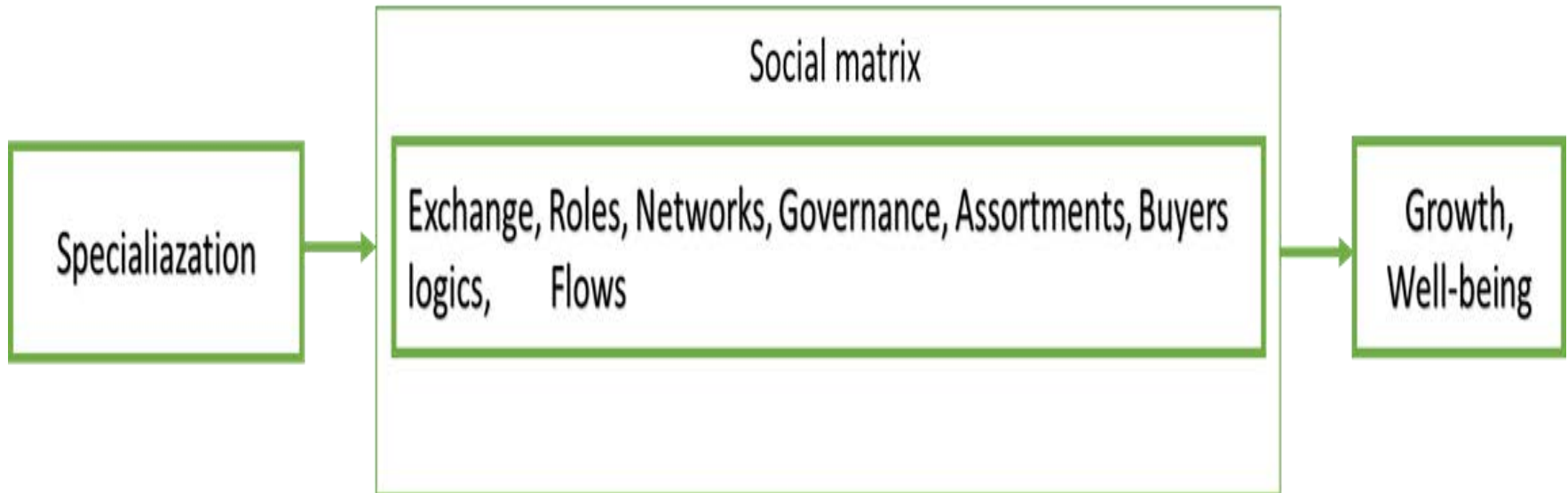


Circular Economy and Circular Business Models

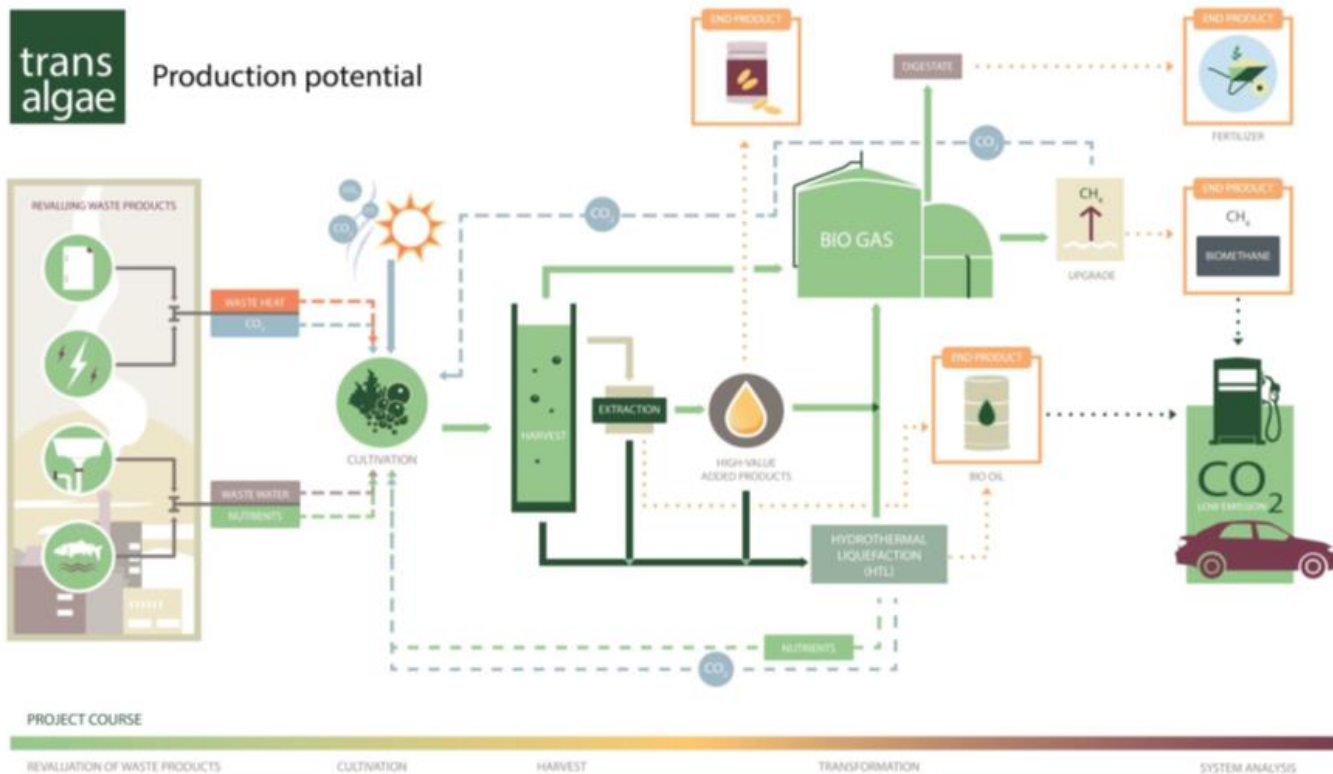


- Circular economy is an economic system with closed material loops (Mentink, 2014)
- Circular business model is the rationale of how an organization creates, delivers and captures value with and within closed material loops (Mentink, 2014)
- Circular business model is in which the conceptual logic for value creation is based on utilizing the economic value retained in products after the use in the production of new offerings (Linder and Willnader, 2015)

Marketing systems theory



The elements of a marketing system. (Layton 2011)



Sustainable Algae Products

