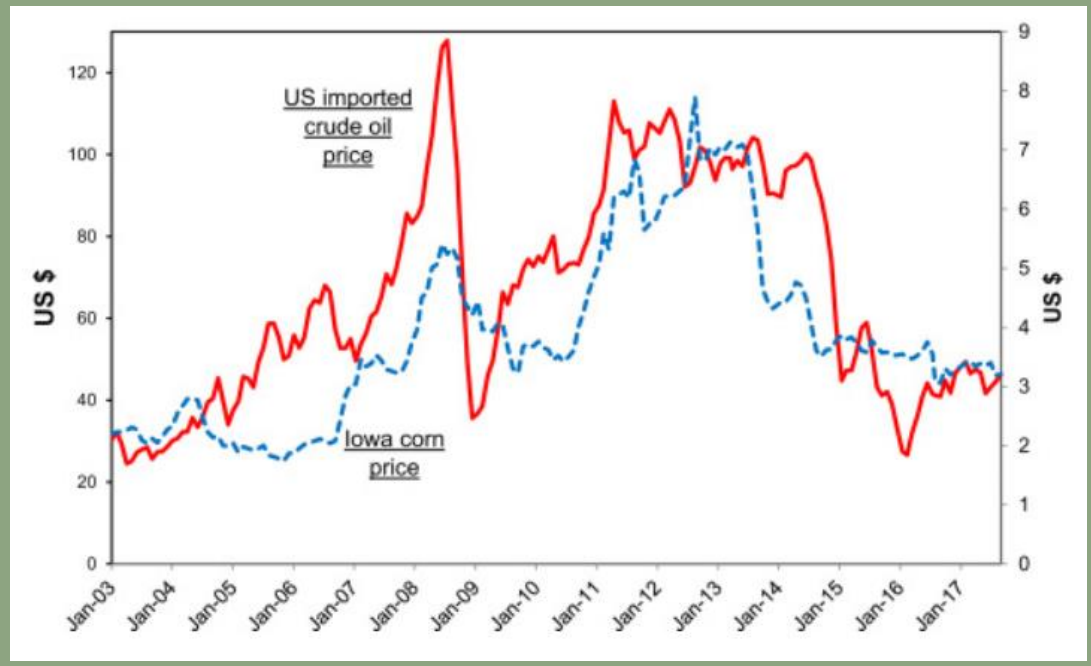
Geothermal EIP & Food production

“64.17% of food price variance is explained by oil price movement”



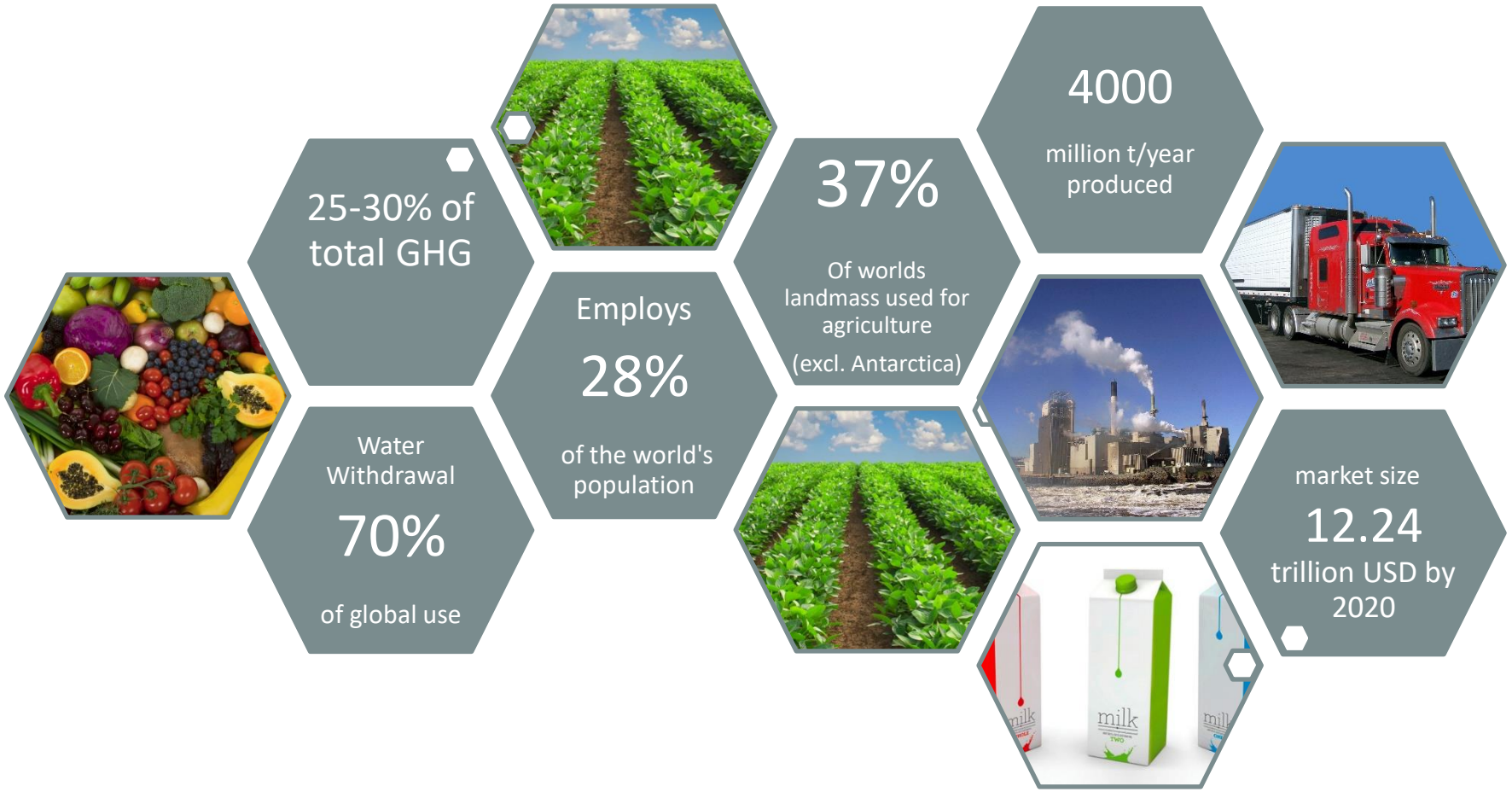
Farhad Taghizadeh-Hesary et al. 2019

The global food system accounts for around 30% of the total energy use

FAO, 2011


Chex
Bitz
KiX
Total
Whiskas
Friskies
Cat

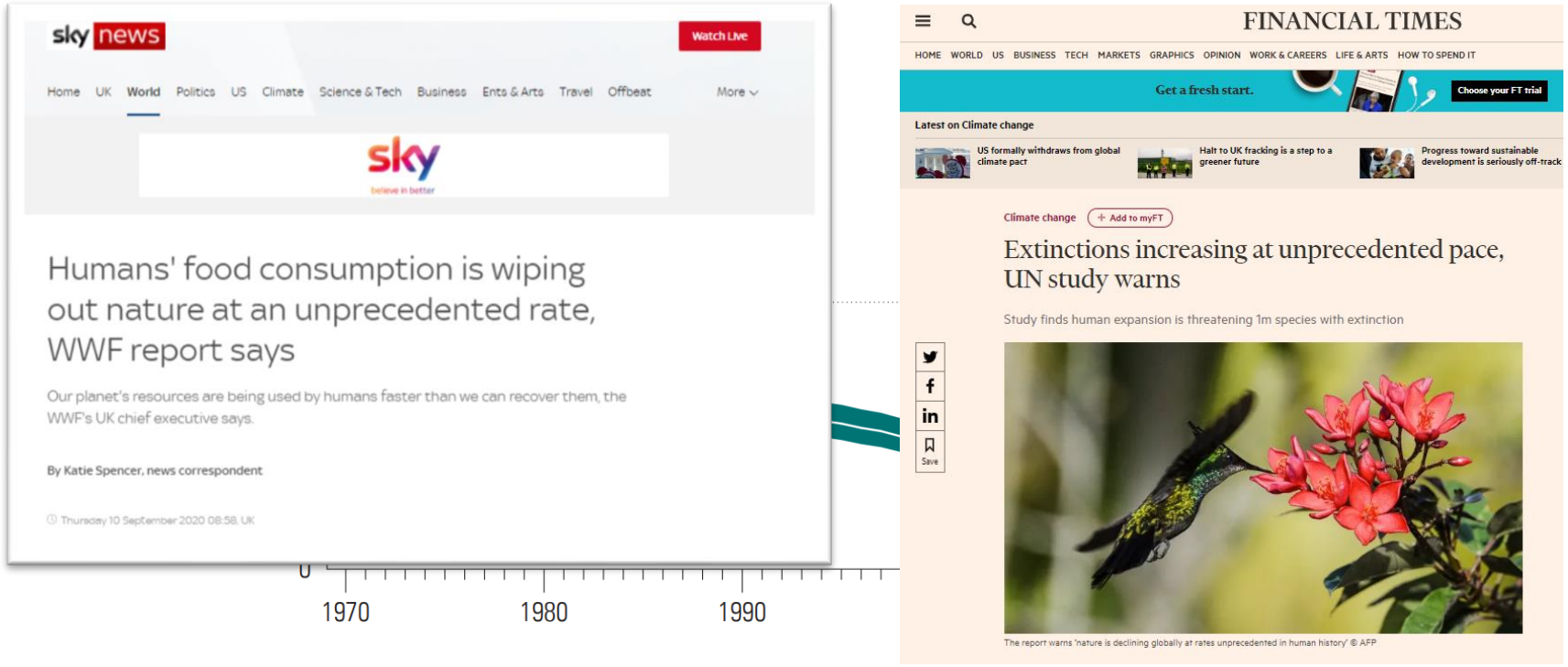
The global food system:



Source: FAO.ORG /World Resources Institute

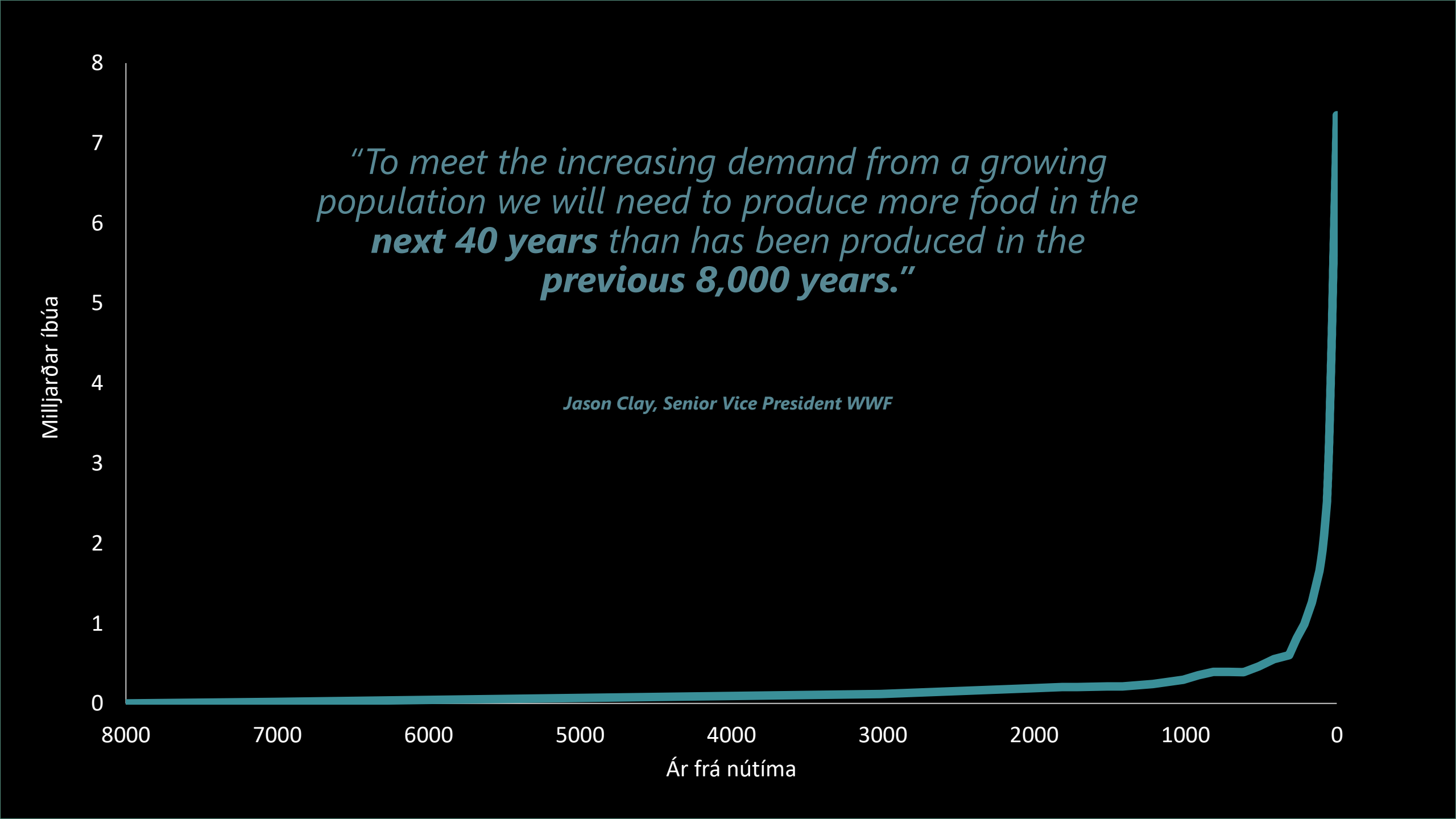
Living Planet Index (LPI)

- In 2020, the LPI shows an average rate of decline in population size of 68% between 1970 and 2016.



RG Reykjavík Geothermal

Landsvirkjun


8
7
6
5
4
3
2
1
0
Milljarðar íbúa
8000
7000
6000
5000
4000
3000
2000
1000
0
Ár frá nútíma
"To meet the increasing demand from a growing population we will need to produce more food in the next 40 years than has been produced in the previous 8,000 years."
Jason Clay, Senior Vice President WWF

The status in 2050

Population will grow to 9-11 billion

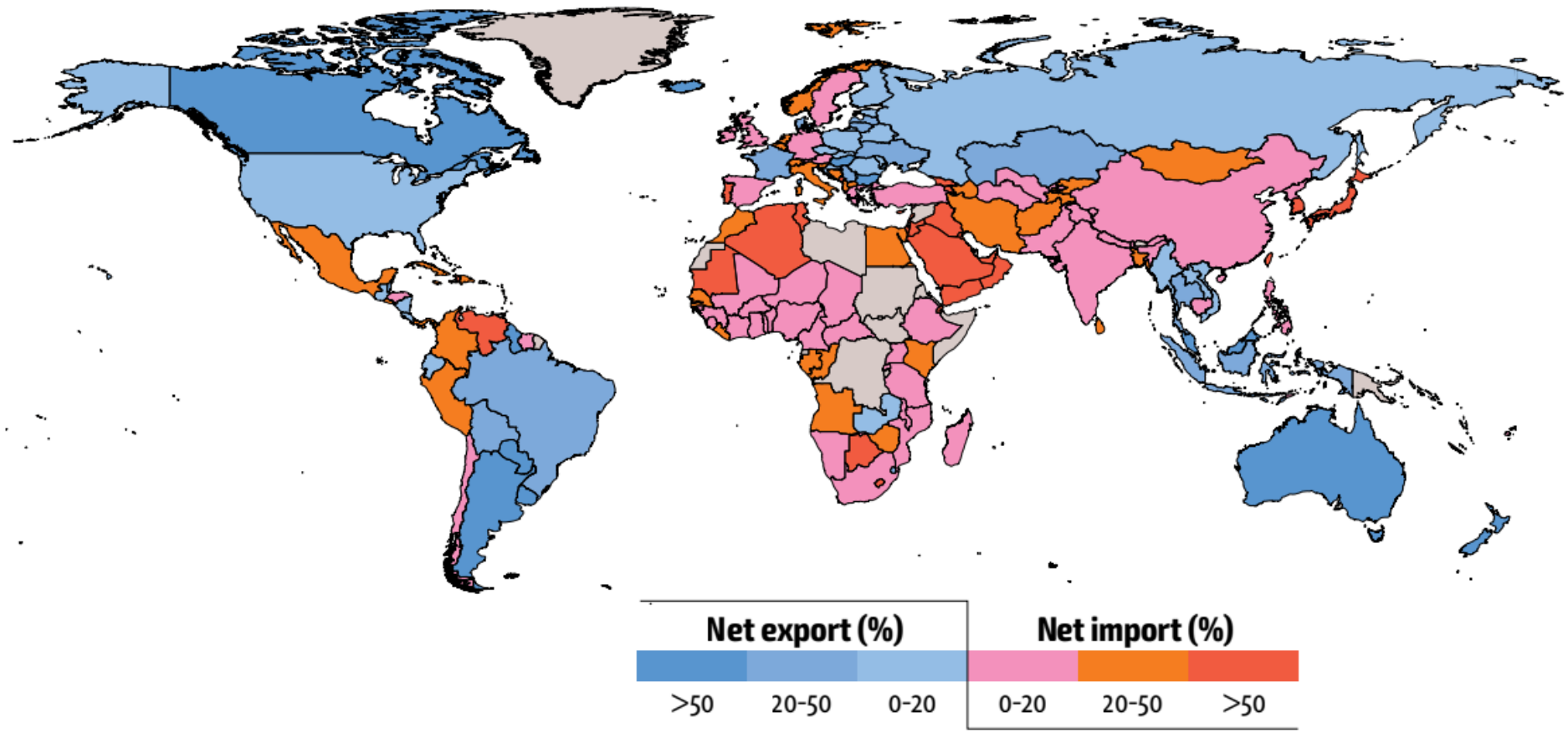
Food production must increase about **50-70%**

4.5 billion will belong to the middle class

Energy consumption will double

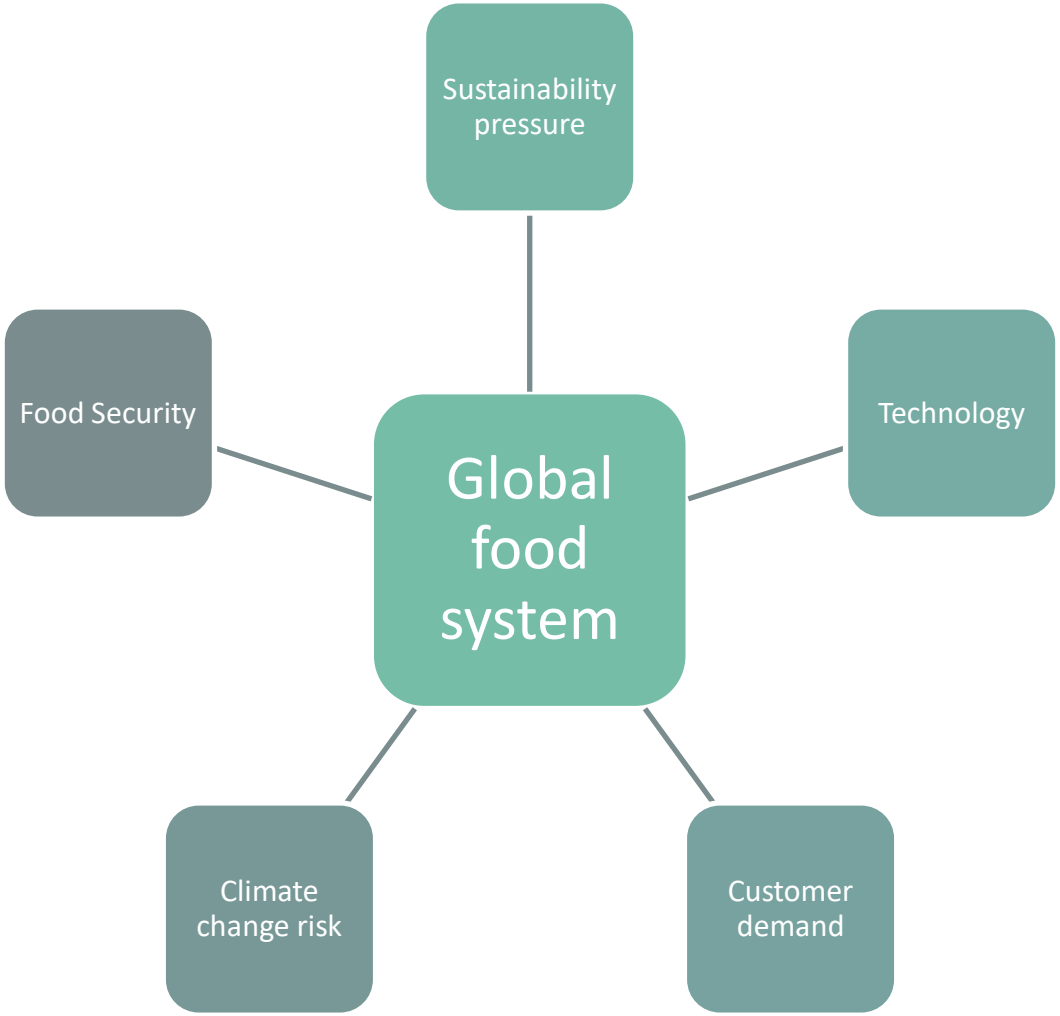
Increased pressure on water resources

Source: FAO.ORG /World Resources Institute/IPCC



Source: FAO Global Perspectives Studies, using 2011 food balance sheets from FAO, 2016a.

The food system is changing



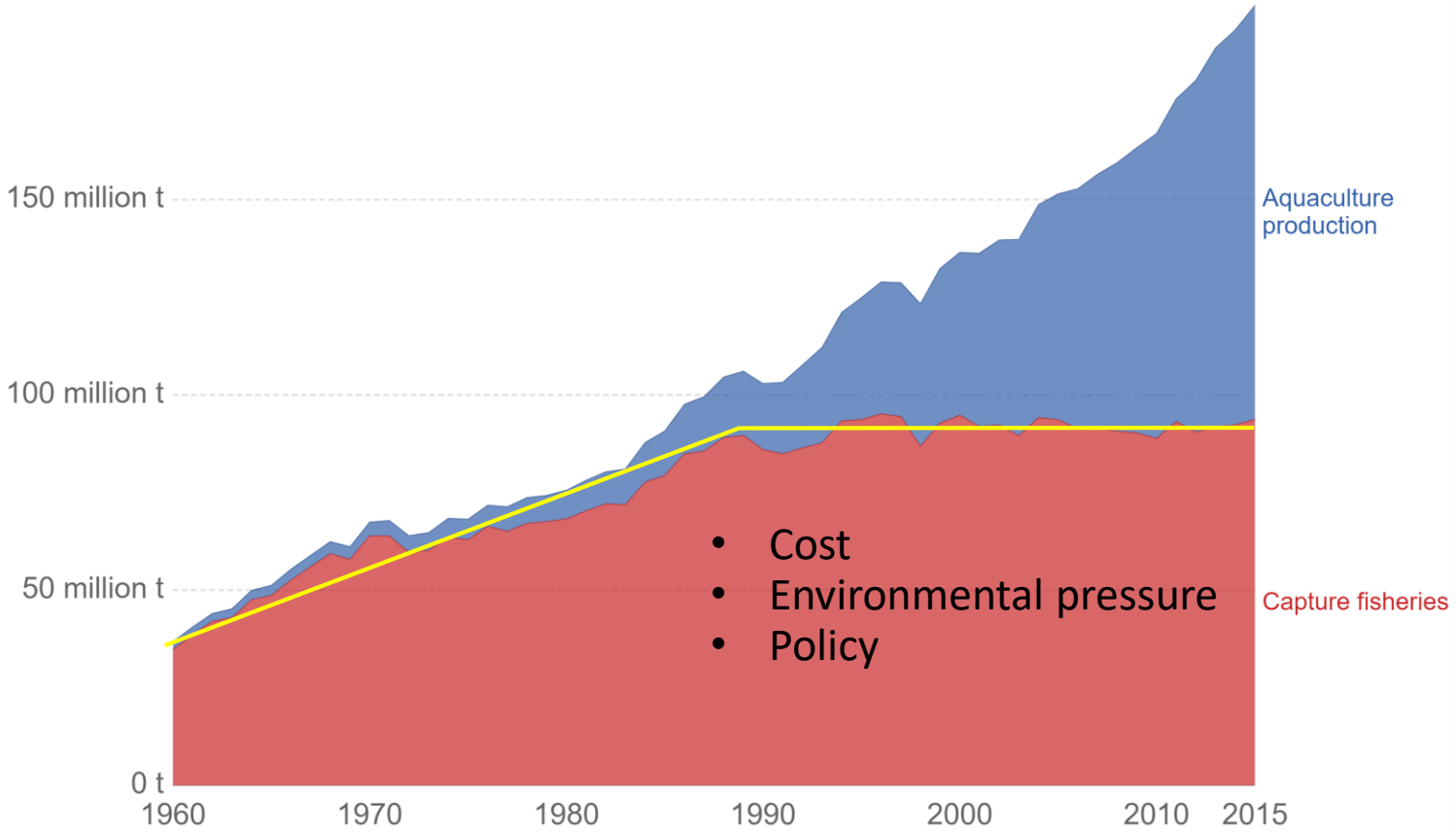
Food system in crisis

How can geothermal be part of the solution?

Seafood production: wild fish catch vs aquaculture, World

Aquaculture is the farming of aquatic organisms including fish, molluscs, crustaceans and aquatic plants. Capture fishery production is the volume of wild fish catches landed for all commercial, industrial, recreational and subsistence purposes.

Our World in Data



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Regional Agenda | Agriculture, Food and Beverage | Food Security and Agriculture
Environment and Natural Resource Security

The future of farming is moving indoors. Here's why

This Swedish farm is working to make farming more sustainable. Image: REUTERS/Edgar Su

This article is published in collaboration with Green Matters

07 Mar 2018

Aimee Lutkin
Freelance blogger

Latest Articles

Owe Pettersson worked in insurance and finances for decades before becoming the chief executive at Plantagon, an indoor farm that recently opened in Sweden. Pettersson told The Huffington Post that indoor farming is the next big thing, and Plantagon is at the forefront, saying, "This will be one of the most advanced food factories located in a city that we have today."

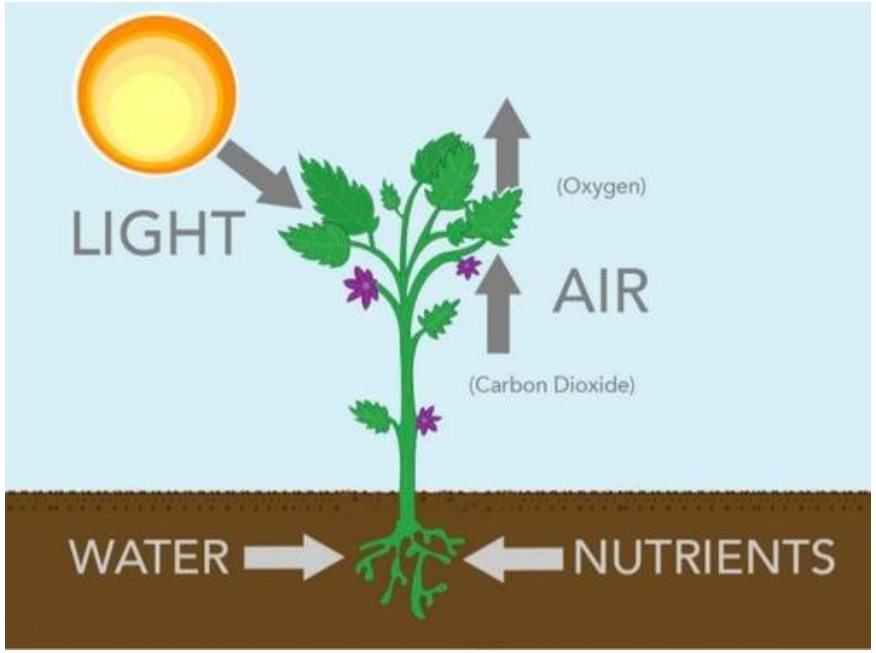
Indoor farming has become far more popular in recent years, as technology has become even more precise, allowing large amounts of greens and fresh produce to be produced in urban environments with both minimal space and far smaller amounts of water than on a traditional farm. For example, it can take as many as 34 gallons to produce a head of lettuce, but Plantagon claims they can produce their crops at about .25 gallon for the equivalent weight in crops.

Source: UN Food and Agriculture Organization (FAO)

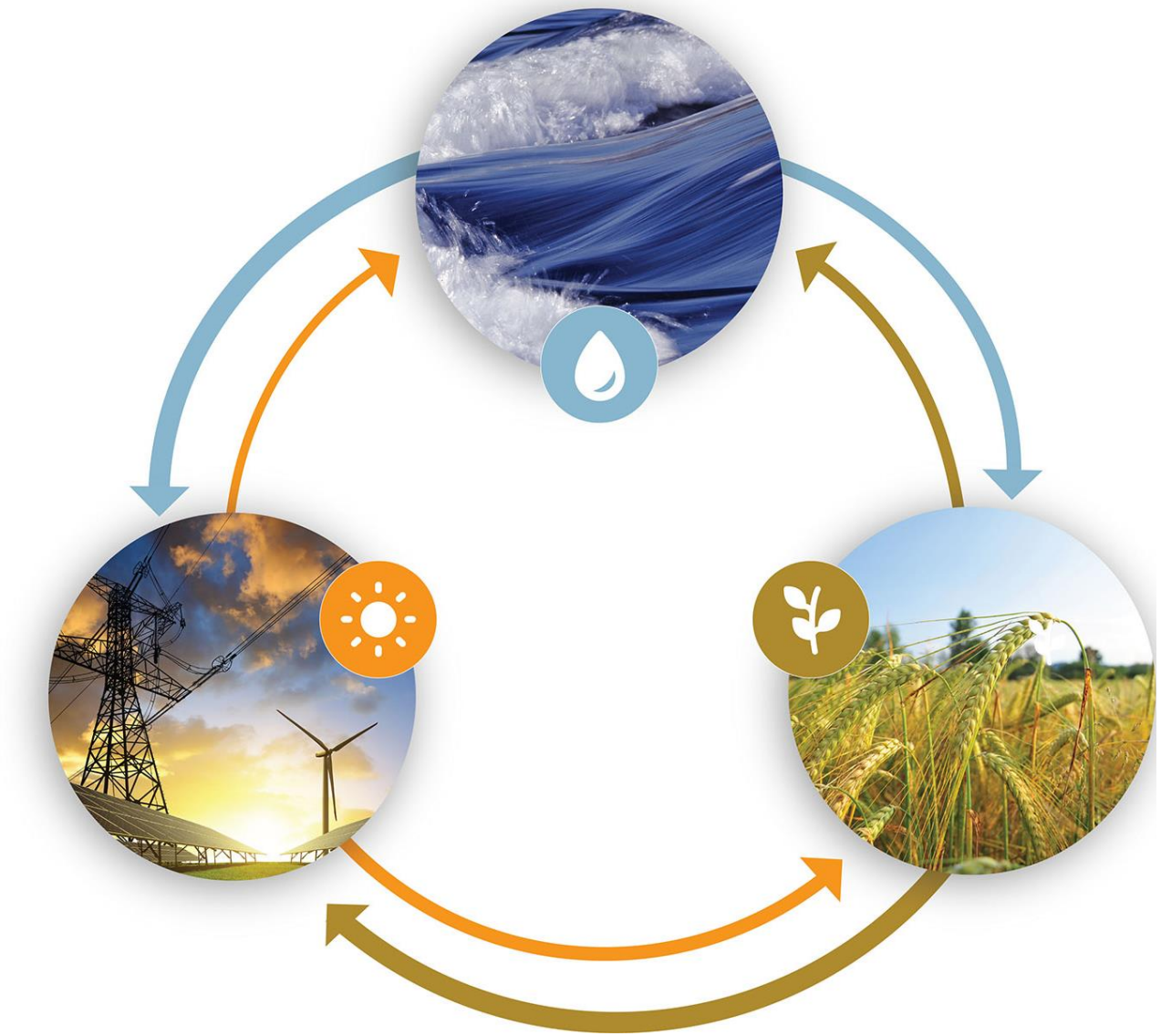
OurWorldInData.org/meat-and-seafood-production-consumption • CC BY

RG Reykjavik Geothermal

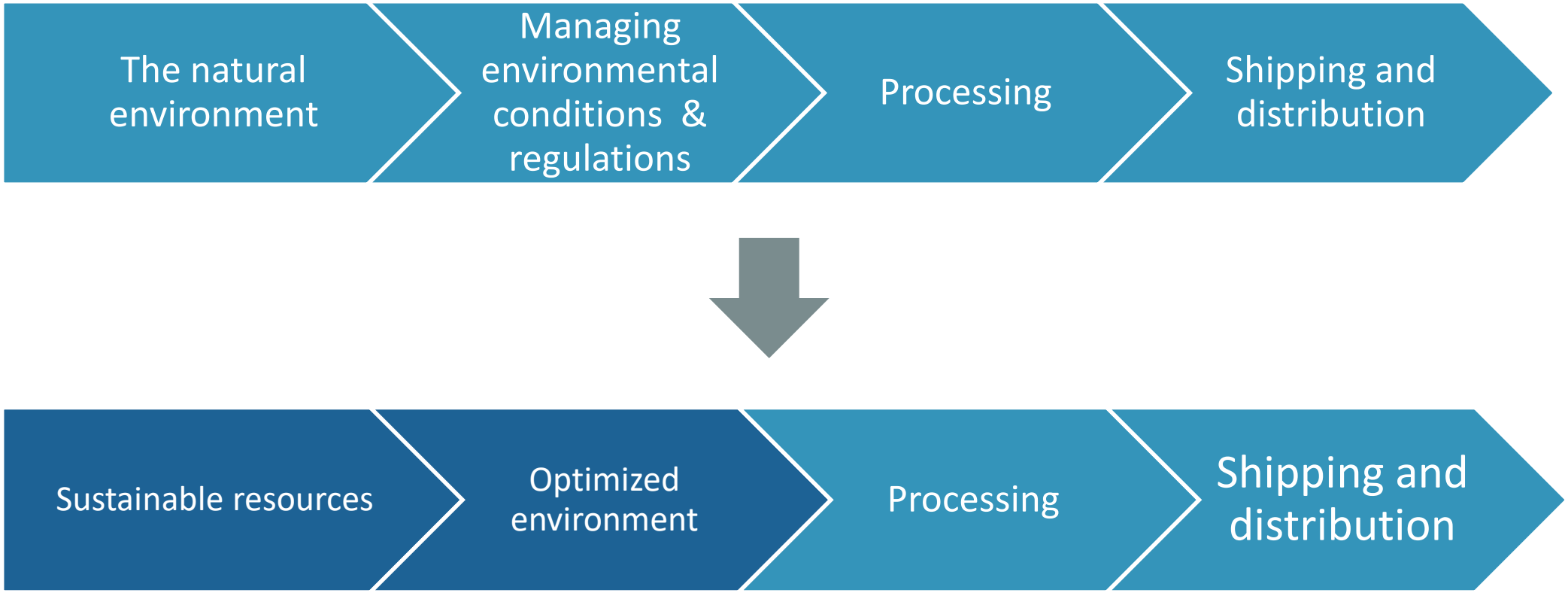
Landsvirkjun


LIGHT
(Oxygen)
AIR
(Carbon Dioxide)
WATER
NUTRIENTS

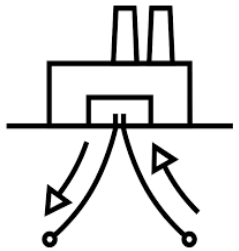
Food-Water-Energy Nexus



https://bush.tamu.edu/istpp/nexus/

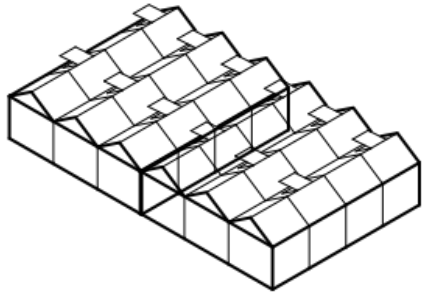

The natural environment
Managing environmental conditions & regulations
Processing
Shipping and distribution
Sustainable resources
Optimized environment
Processing
Shipping and distribution

Electricity to the grid



Geothermal Plant

CO2
Steam / hot water
Electricity
Water
Chemicals



Bio based industries

Steam/hot water
Electricity
Water

Post processing

Increased value from local agriculture

Innovation will drive adoption to climate neutral food system

RG Reykjavík Geothermal

Landsvirkjun


CAUTION
2,9 9½ HIGH

Future food system trends


Food Security


Trust and transparency


Clean and sustainable

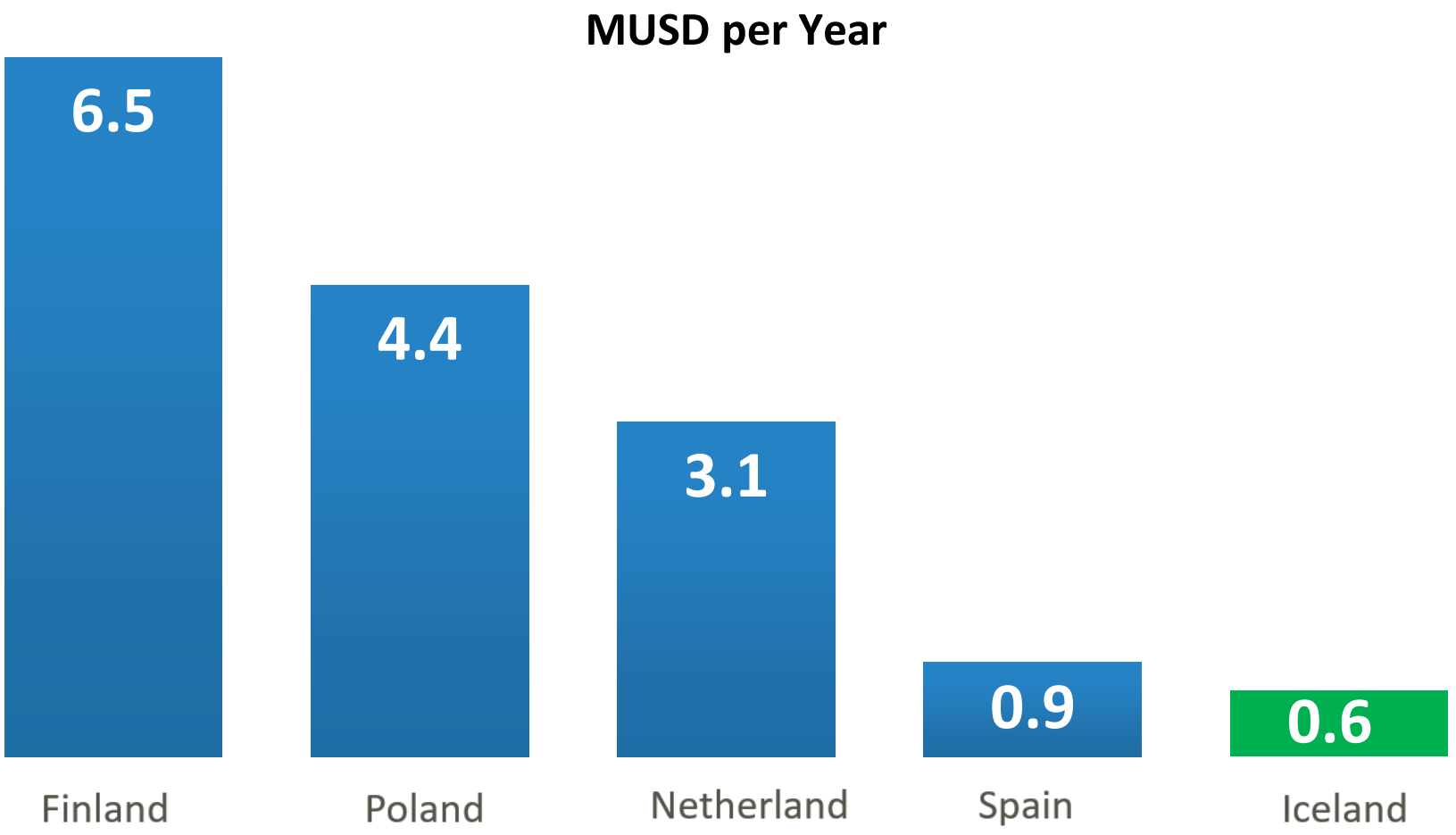

Increased automation


Optimized resources use


Controlled environment

The competitiveness of geothermal energy for food production

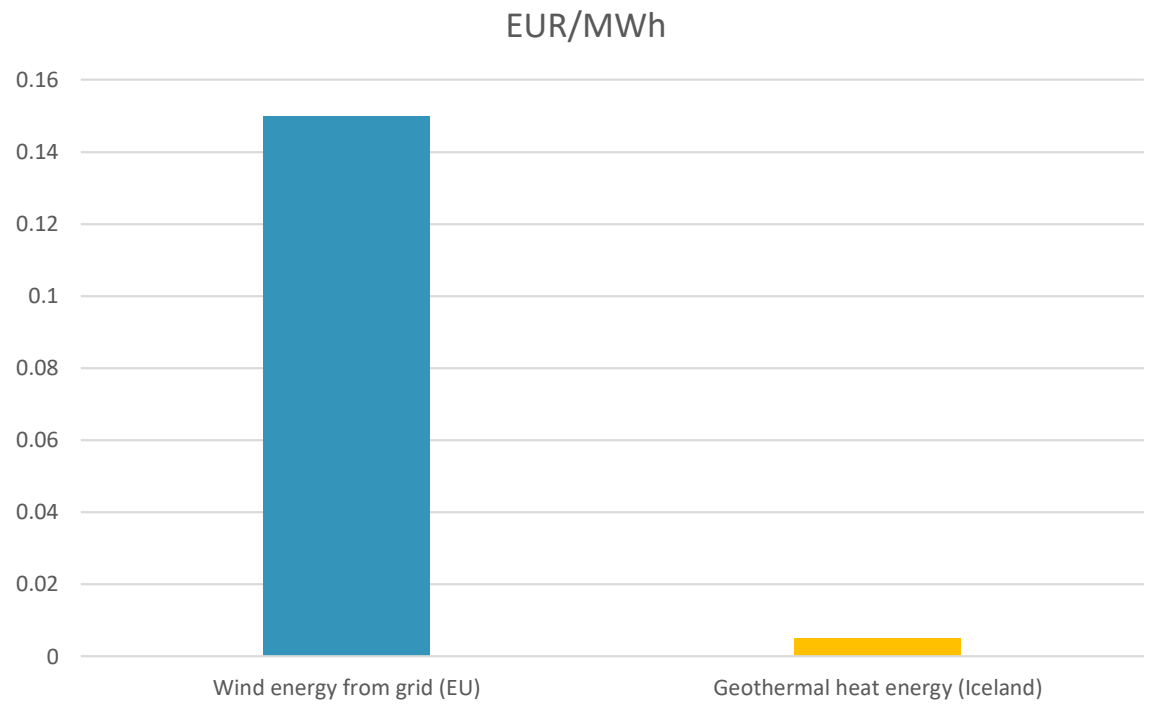
The cost of heating 4 ha greenhouse



RG Reykjavik Geothermal

Landsvirkjun

Direct use of geothermal heat vs wind energy from the grid for food processing



RG Reykjavik Geothermal

Landsvirkjun

Example of Mokai New Zealand

Tomatoes -11.4 hectares

110 MW
Tuaropaki power company / Mercury Energy

Miraka milk processing plant
(250.000.000 liters of milk process annually)

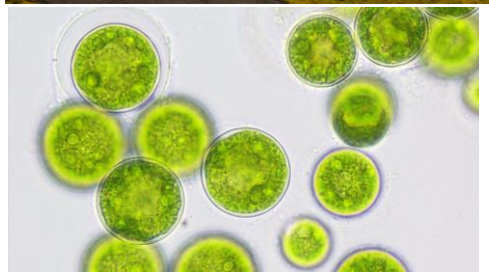
RG Reykjavík Geothermal

Landsvirkjun

VAXA
Hellisheidi Geothermal plant (ON Power)

CO2

Electricity

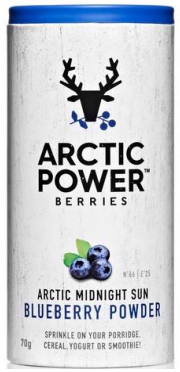


RG Reykjavík Geothermal

Landsvirkjun


MIXOLOGY
Superb
SMOOTHIE

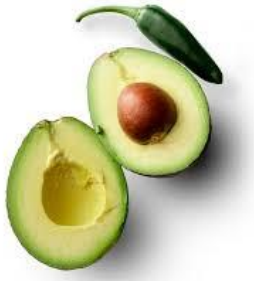

McCormick
RECIPES UNDER LABEL
Perfect Pinch
Lemon & Pepper


ARCTIC
POWER
BERRIES
ARCTIC MIDNIGHT SUN
BLUEBERRY POWDER
SPRINKLE ON YOUR PORRIDGE, CEREAL, YOGURT OR SMOOTHIE!


Nested
SUPER
ALGAE
120

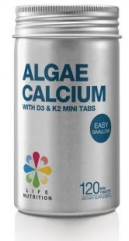

babynat
Organic
Growing up milk
With Bifidus
Natural Calcium and Vitamin E
Iron and vitamins
900g


now
essential oils
100 % pure
lavender
lavande




MADE WITH REAL FRUIT
Natierra
ORGANIC
BANANAS


Mountain House
Wraps
Chicken Salad


ALGAE
CALCIUM
WITH D3 & K2 MINI TABS
120

Shared Infrastructure & Technology

Work with Rescearch institutions and universities

Encourage local innovation

Increased value with processing