



# The Future of Food:

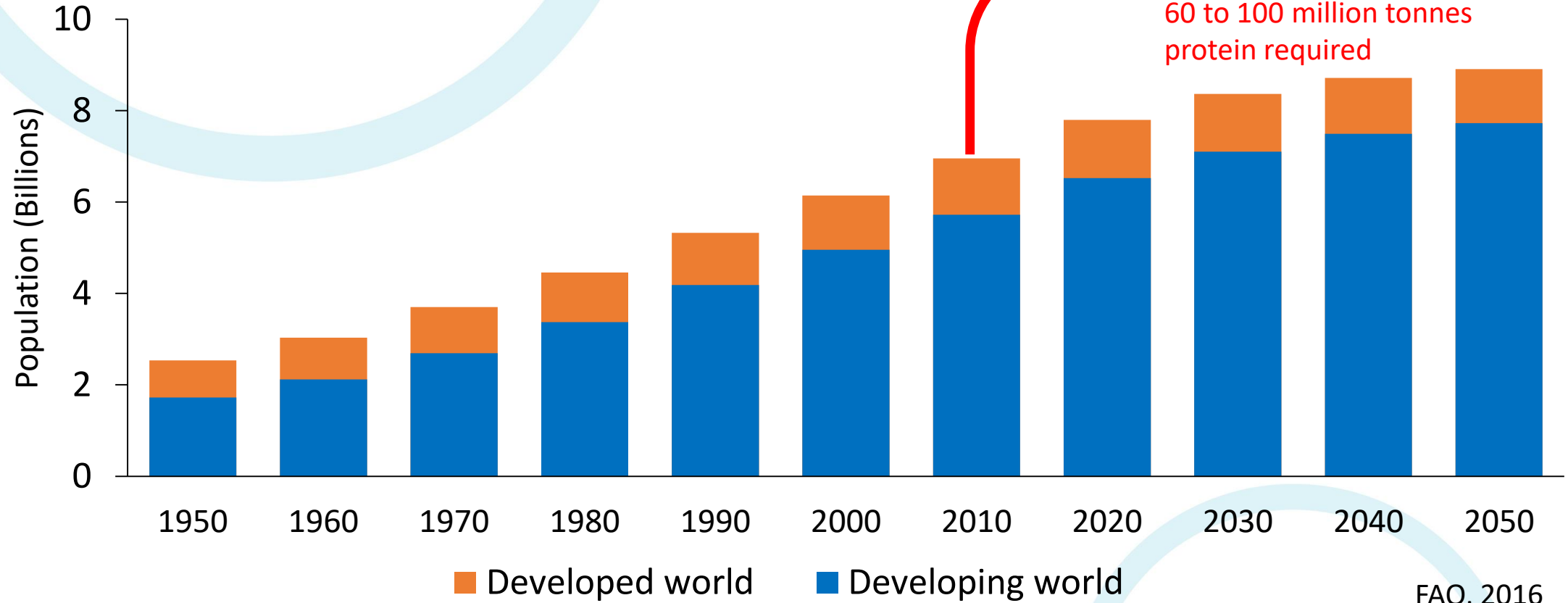
## Exploring the need for a protein plan

Michael Lenaghan  
Environmental Policy Advisor

**“Zero Waste Scotland...a lighthouse  
for the circular economy”**

Walter Stahel, circular economy pioneer

# The Protein Gap:

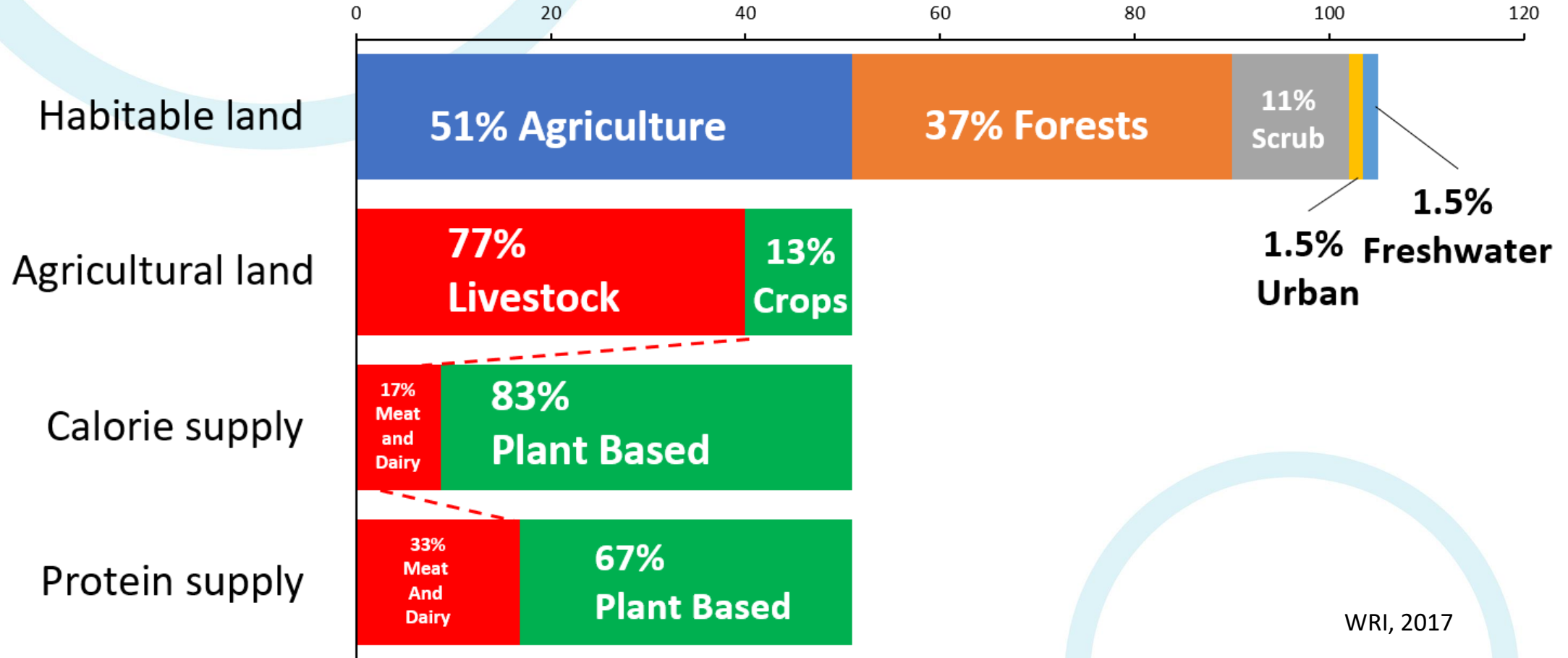


**By 2050, the global population will exceed 9 billion and we will need 60-100 million tonnes of additional protein**

# The Land Gap:



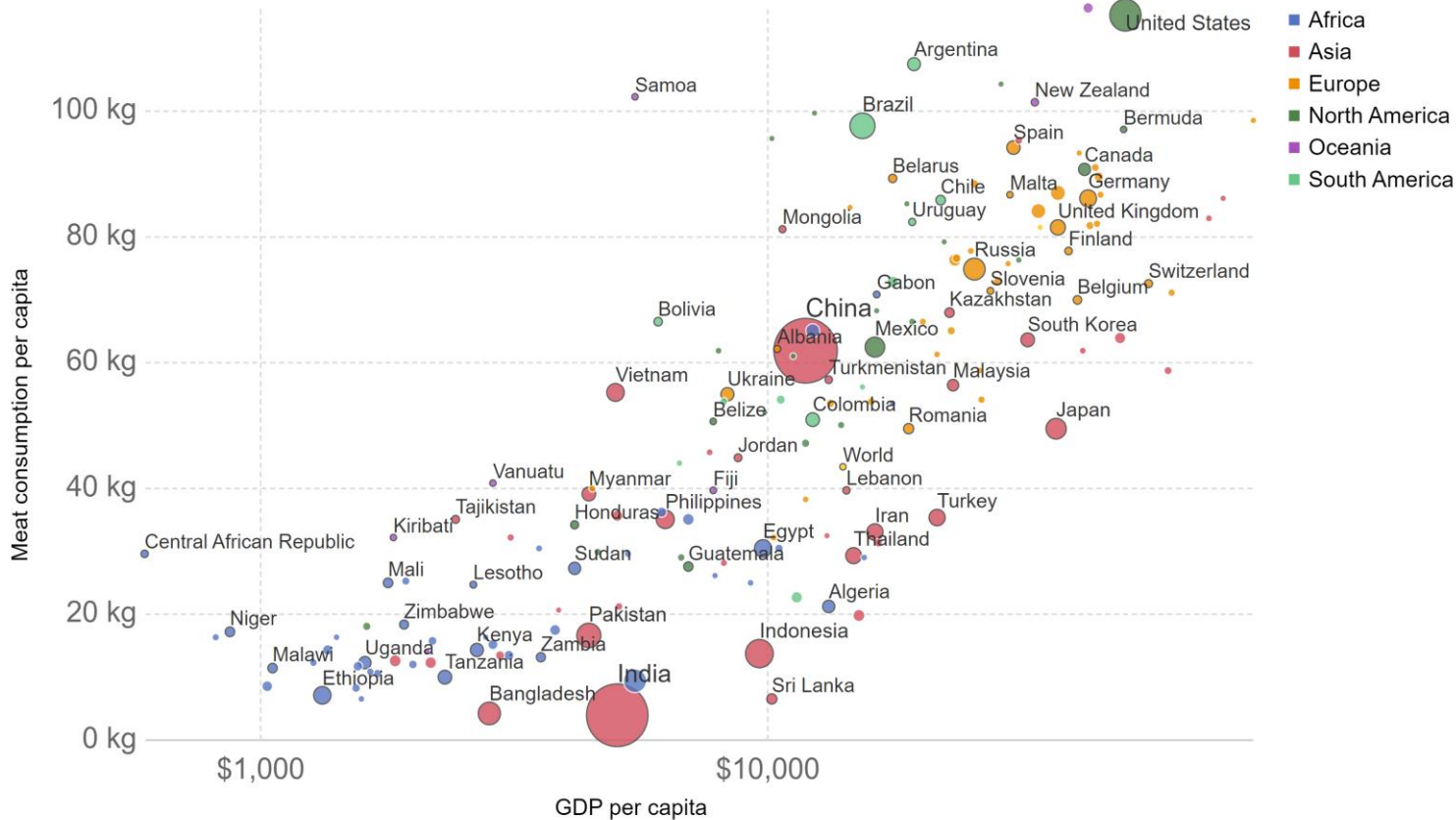
### Global Land allocation for food production (Million Km2)



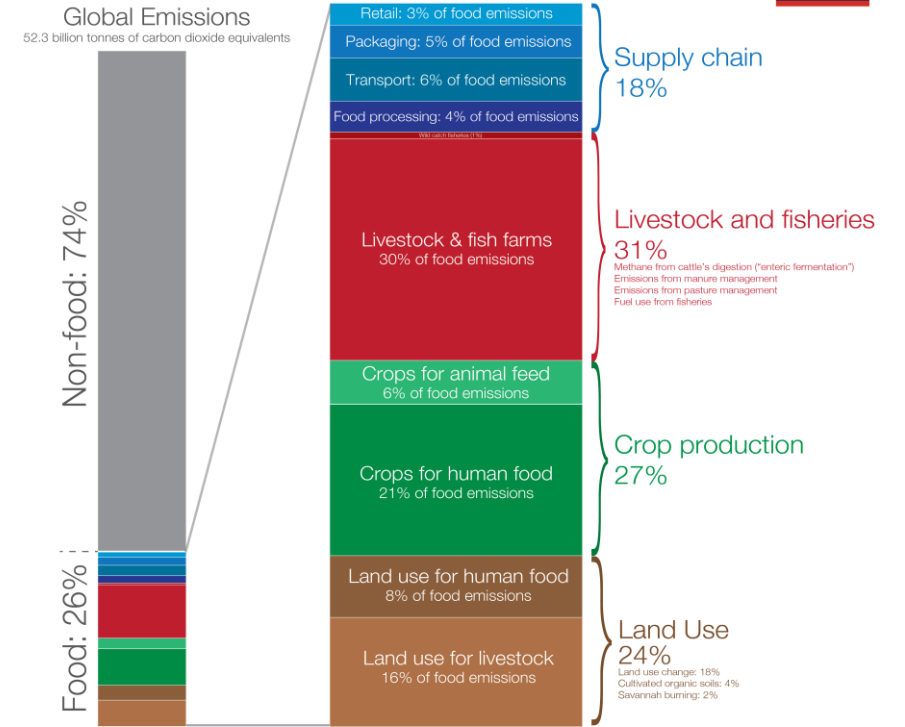
WRI, 2017

**51% of habitable surface is now used for food systems with 77% of that area used to feed and house livestock**

# The Emissions Gap:



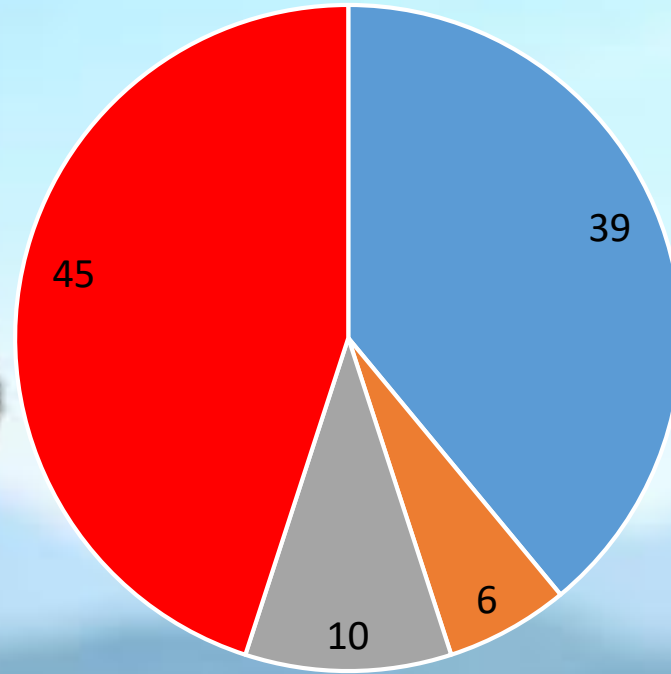
Global greenhouse gas emissions from food production Our World in Data



Data source: Joseph Poore & Thomas Nemecek (2018). Reducing food's environmental impacts through producers and consumers. Published in Science. OurWorldinData.org - Research and data to make progress against the world's largest problems. Licensed under CC-BY by the author Hannah Ritchie.

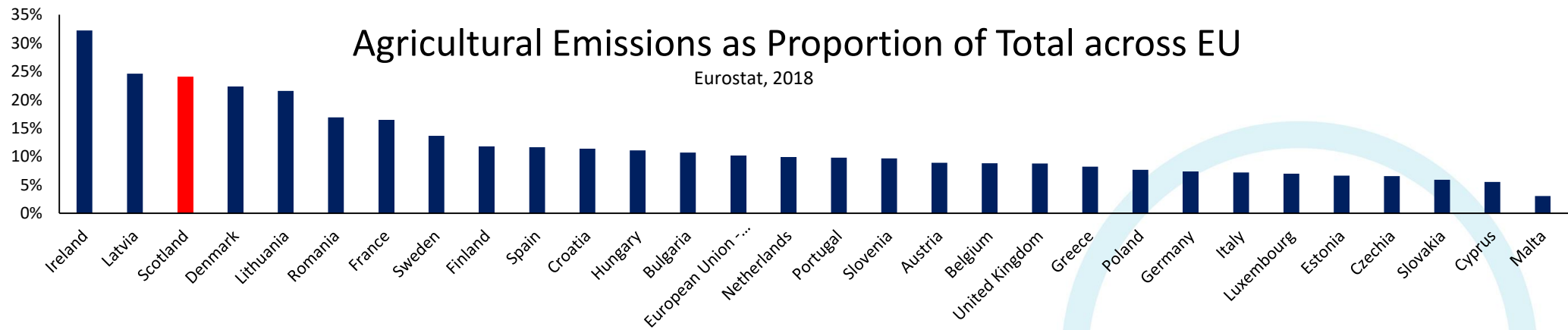
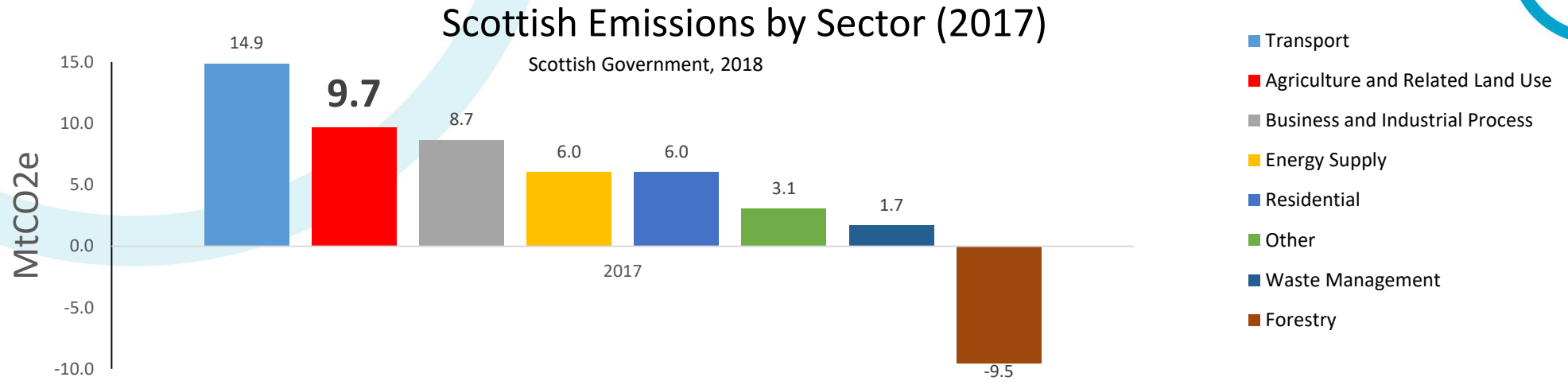
**Per capita animal protein consumption vs GDP per capita indicates:  
Increasing animal protein demand with future urbanisation**

**Food systems already account for:  
26% global GHG emissions**



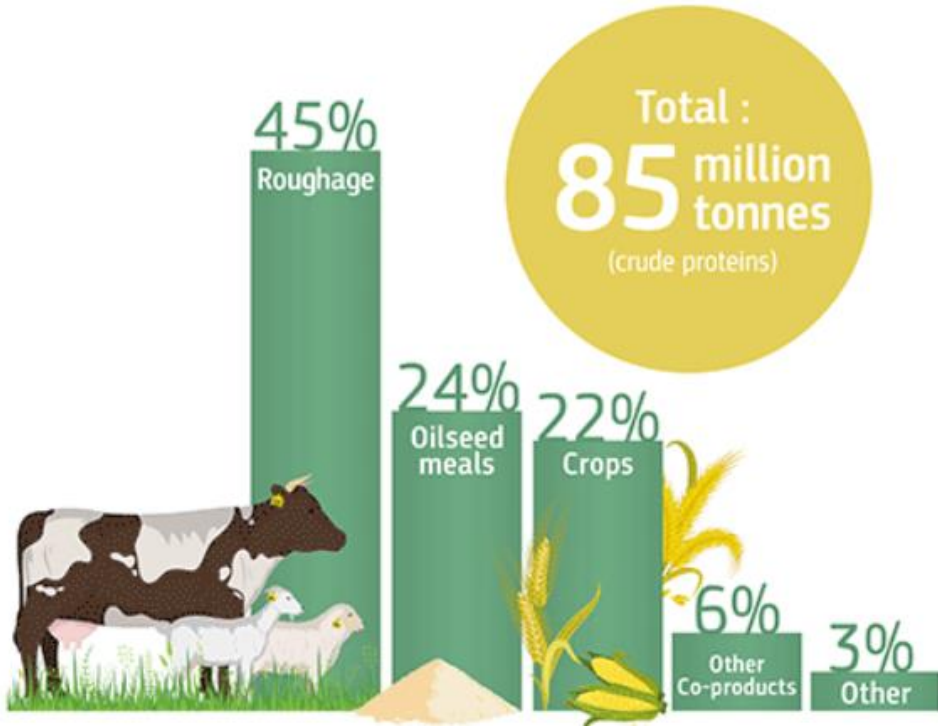
- Enteric fermentation
- Processing and Transportation
- Manure storage
- Feed Production

# Where are we now?



**\*industry could only deliver 19% of the aspirational carbon reduction target by 2035, highlighting the urgent need to advance technologies and develop new innovations to address this critical issue\* - CIEL UK Net Zero Report 2020**

# EU protein balance sheet:



2019/20 Protein source	Million tonnes (crude protein)		% feed use of EU origin (I) / (H)
	EU total feed use (H) = (E) * (G)	Feed use EU origin (I) = (F) * (G)	
<b>TOTAL</b>	<b>84</b>	<b>66</b>	<b>78%</b>
<b>Legend</b>			
Low-Pro: Less than 15% protein content	56.15	54.35	97%
Medium-Pro: 15-30% protein content	4.46	3.91	88%
High-Pro: 30-50% protein content	21.17	5.50	26%
Super-Pro: Over 50% protein content	2.27	1.95	86%

## 78% of the feed used in the EU is from the EU

- EU's self-sufficiency in terms of High-Pro feed ingredients (soya beans, soya bean meals, etc) is **only 26%**

## Insects are in between High-Pro and Super-Pro (depending on the species)

- so they can improve the situation (i.e. improve local/EU self-sufficiency in terms of High-Pro feed ingredients).





# The Future of Food:



## 1. Food systems are unique

- Bioeconomy industries including agriculture and aquaculture hold the keys to unlock Scotlands sustainability potential and future food security

## 2. There is no “silver bullet”

- Food production and impacts are complex and there is no immediate technofix so a coordinated, systemic, holistic, approach to enable environmental and economic sustainability and shared value within and between sectors is critical

## 3. Now is the time for positive action

- Government industry, academia, finance, and other bioeconomy sectors can guide the transition to a low carbon future by developing and implementing a strategic approach to protein production which considers and integrates circular bioeconomy

# National protein strategies



*We cant solve the climate crisis, ecosystem degradation biodiversity loss or future food security without changing the way we produce and consume protein*

Governments around the world have developed, or are developing, holistic sustainable protein plans to support their climate objectives, and ensure the long-term viability of their domestic agriculture and food and drink industries...



Germany  
2014



France 2014



EU 2018



Netherlands  
2018



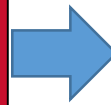
Finland 2018



Denmark  
2018



Manitoba 2018



Spain  
Austria  
Belgium



Scotland 2021?



# Thankyou !

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