



Planet Friendly Eating

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Why what we eat matters

Main environmental stress areas:

Water availability: Agriculture uses 70% of fresh water – 38% in US

Energy availability: Food production uses 16% of all energy in US

Land availability: >third of available land is used for food production

Air, water and soil pollution: ~180 million tons of fertilizer and ~3 million tons of pesticides are applied globally every year

Biodiversity: Declining and under serious and continued threat - intensive food production is a major contributor

Climate change: Food system accounts for ~30% of total greenhouse gas emissions



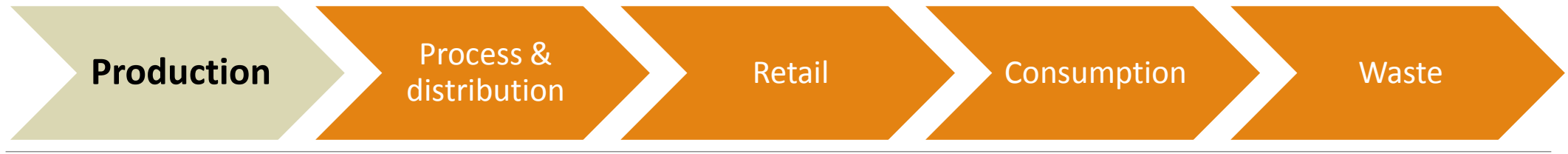
➤ All exacerbated by growing population – 9 billion by 2050.

➤ Technology alone not a solution...

Processes that cause environmental impacts

Food life cycle:





All processes involved in growing the crops:

- Use of energy/oil – machinery; manufacture of pesticide and fertilizer
- Land use for growing crops
- Water – irrigation and machinery
- Building materials – animal sheds; barn

Production accounts for most of the life cycle impact – typically over 40%.



All of the processes that occur from the farm gate to how we find it at the supermarket:

- Transport from farm to factory, processing plant, distribution center, etc.
 - Processing
 - Packaging
 - Cooking
-
- For some products the impact is dramatic: meat – slaughter – by products, water pollution, cutting, packaging, storage/refrigeration; for some it is minimal: fruits or veg which may or may not be washed, trimmed, packaged, refrigerated.
 - Also varies by level of processing – tomatoes made into ketchup vs tomatoes for eating whole

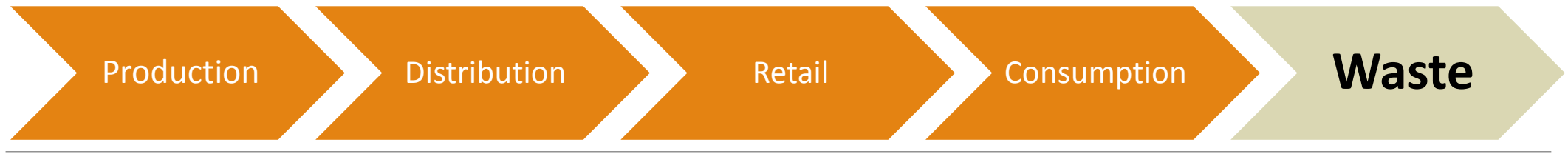


- Storage
- Handling
- Product refrigeration
- Cooking/processing
- Store lighting/heating/cooling/cleaning
- More packaging (plastic bags)



- Consumer travel to and from retail outlet
- Storage
- Preparation (washing etc)
- Cooking
- Post-cooking storage – foil, cling film etc,
- Dish washing

For the average American, 54% of carbon footprint from food occurs prior to the point of consumption



Waste occurs at each life cycle stage:

- Production - farming inefficiencies/spoilage; manure piles/slurry lagoons
- Distribution - food trimmings, over-packaging etc
- Retail - spoilage, rejection, faulty equipment, food scraps
- Consumption – packaging, food scraps, spoilage, sewerage



- Avoidable food waste accounts for between 29% and 40% of annual food production in US
- Globally, one third of all food produced is wasted – mostly in industrialized nations
- American households throw away approximately 25% of the food and beverages they buy
- Removing food waste from landfills in UK would reduce emissions equivalent to taking 20% of all cars off the road

Which foods are 'green'?



Animals

Plants

Environmental impacts of different foods

Water use

- Water required to produce 1kg:
- Apples 700 liters
- Soybean 2,145 liters
- Beef 15,400 liters
- Per serving ~375 liters for soybeans and 2,700 liters for beef.
- Average American family of 4 uses ~1,500 liters of water/day.
- Standard shower head uses ~9 liters of water/minute.

‘Climate change is projected to reduce renewable surface water and groundwater resources in most dry subtropical regions’.
IPCC, 2014



Energy use

Energy used to produce 1kg:

- Peaches 344 kJ
- Beans 2,861 kJ
- Almonds 4,646 kJ
- Beef 7,880 kJ

Average American home uses 104,400 kJ electricity per day

‘Energy use can be substantially lowered through changes in consumption patterns, adoption of energy savings measures, **dietary change and reduction in food wastes.’**
IPCC, 2014.



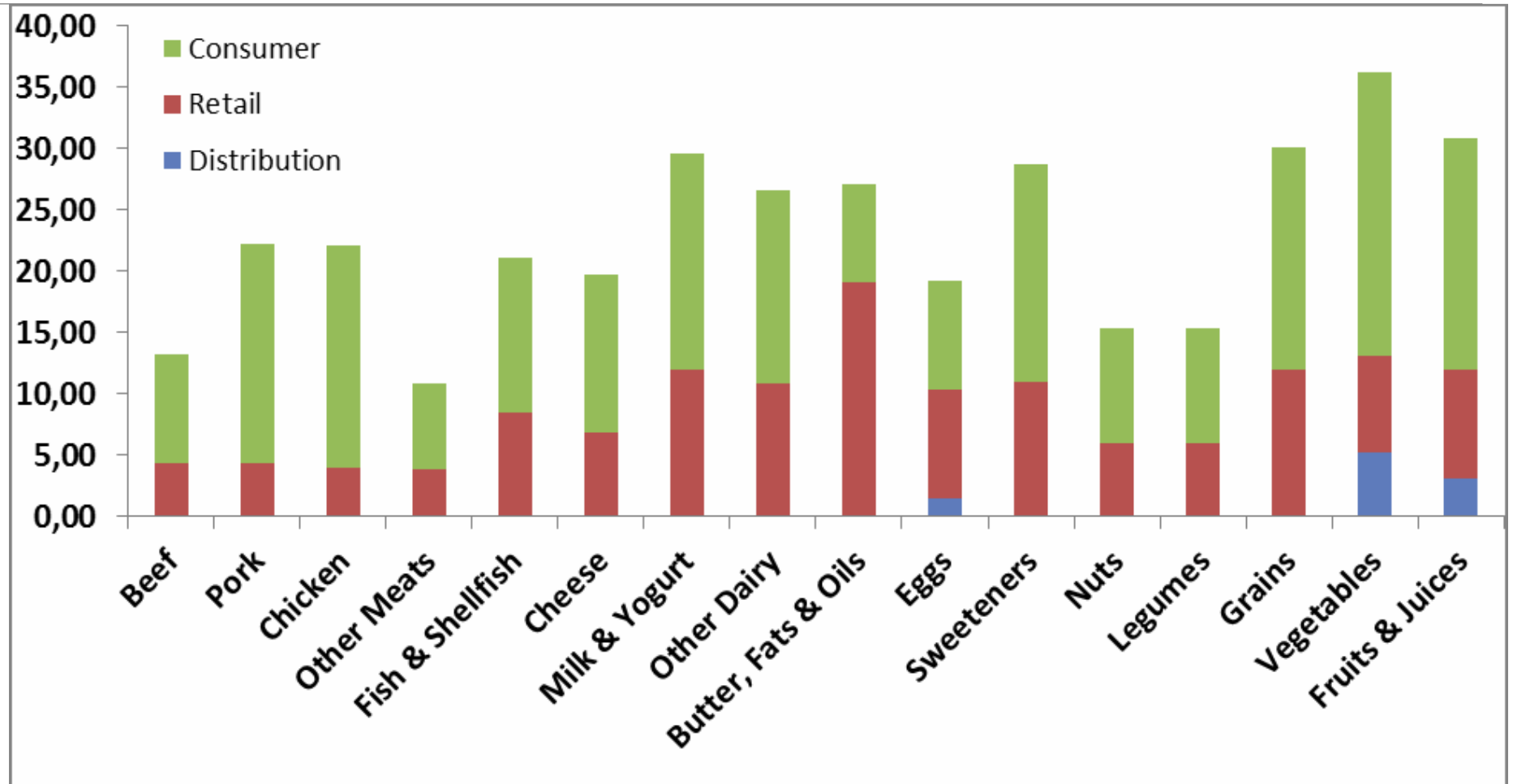
Land use

In comparison to tofu:

- Beef requires 32-900 times more land
- Lamb requires 73 times more land
- Chicken requires 10-16 times more land
- In comparison to staples like potatoes, wheat, and rice, beef requires 160 times more land
- Currently around 70% of agricultural land and 45% of global land surface are used for livestock production
- Beef production uses ~60% of agricultural land, but produces <2% of the calories that feed the global population
- Land is finite – increasing current food production not possible...

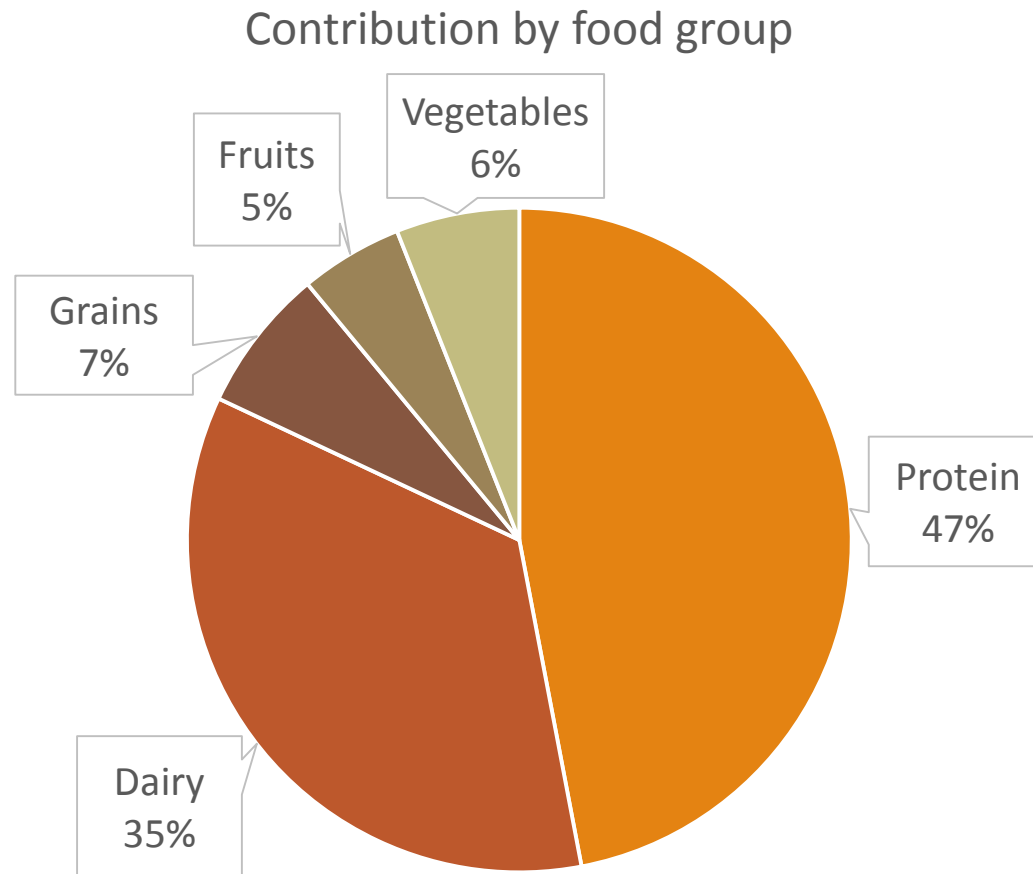


Waste



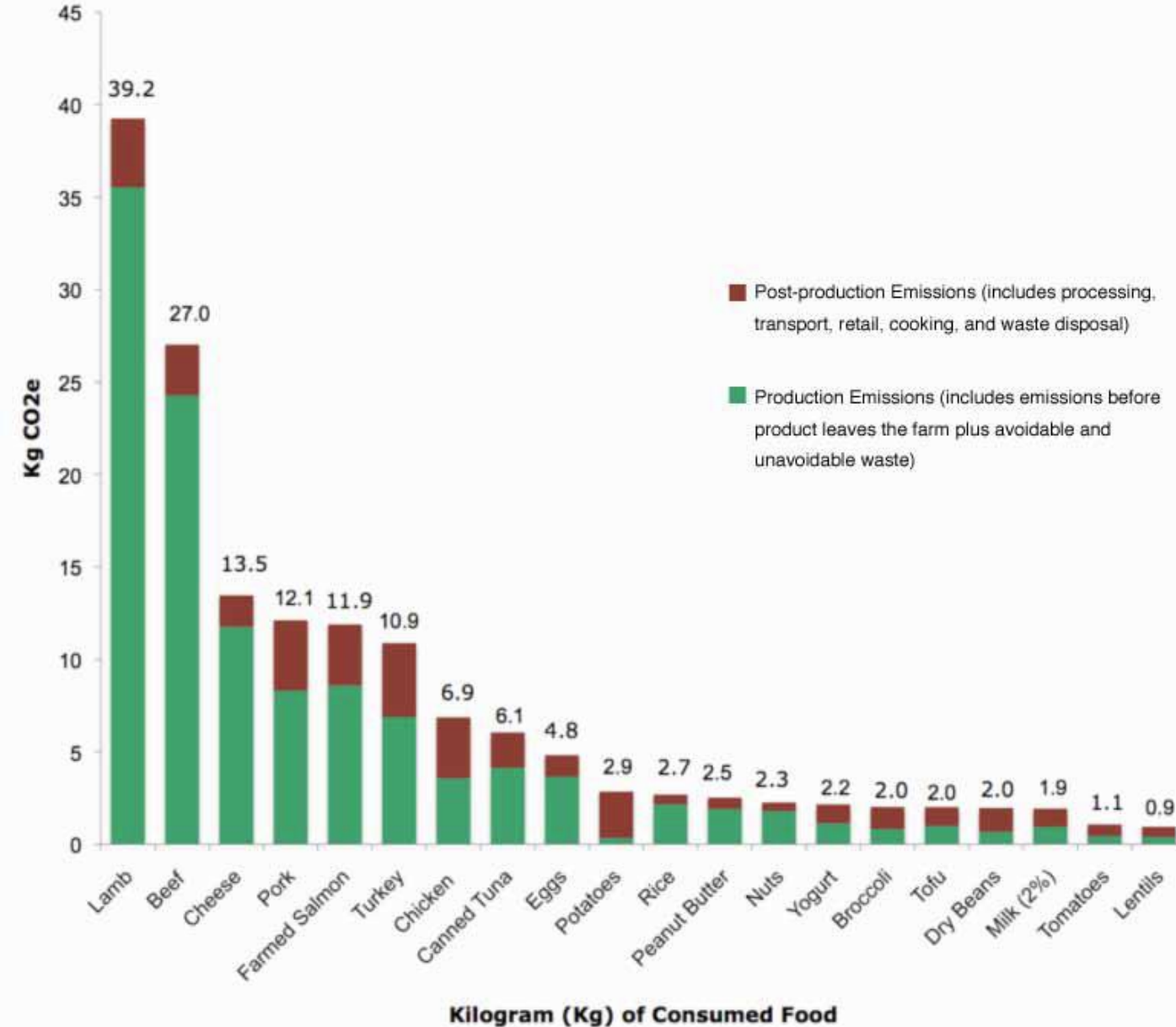
Source: Venkat, 2012.

Greenhouse gas emissions



‘Achieving 2050 emissions targets would require ~50% reduction in mean per capita meat consumption in the developed world.’ Davidson, 2014.

GHGs per food item



Source: Hamerschlag and Venkat, 2011.

Diet and environment: wider context

Increasing awareness amongst academics, policy makers, organizations and society:

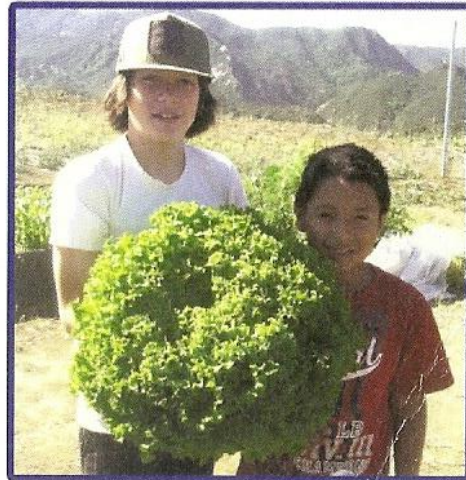
- Large body of scientific evidence, growing each year
- Swedish National Food Administration and Swedish EPA, 2009 *"Meat is the food group that has the greatest impact on the environment,"* and *"Eating less meat, and making careful choices about what you eat, is therefore the smartest environmental choice you can make"*
- People's climate march, September, NY, before UN climate summit. 400k people
- Local example – MUSE school



One Meal a Day for the Planet!

MUSE School CA will be a Plant-Based School in Fall 2015

WHY? Eating one plant-based meal a day reduces our carbon footprint by 75%!



HOW? MUSE's Executive Chef expertly prepares lunch + two snacks every day in our certified green restaurant. Most food allergies accommodated.

Fresh + filling lunches include healthy amounts of plant-based fats, including nuts, seeds, hemp flour, coconut oil and avocados.

MUSE kids get plenty of protein through a wide variety of plants, such as legumes, avocados, seeds, nuts, spinach, quinoa, sprouted grains + hemp flour.

MUSE kids help harvest their own vegetables + proteins in our campus gardens.

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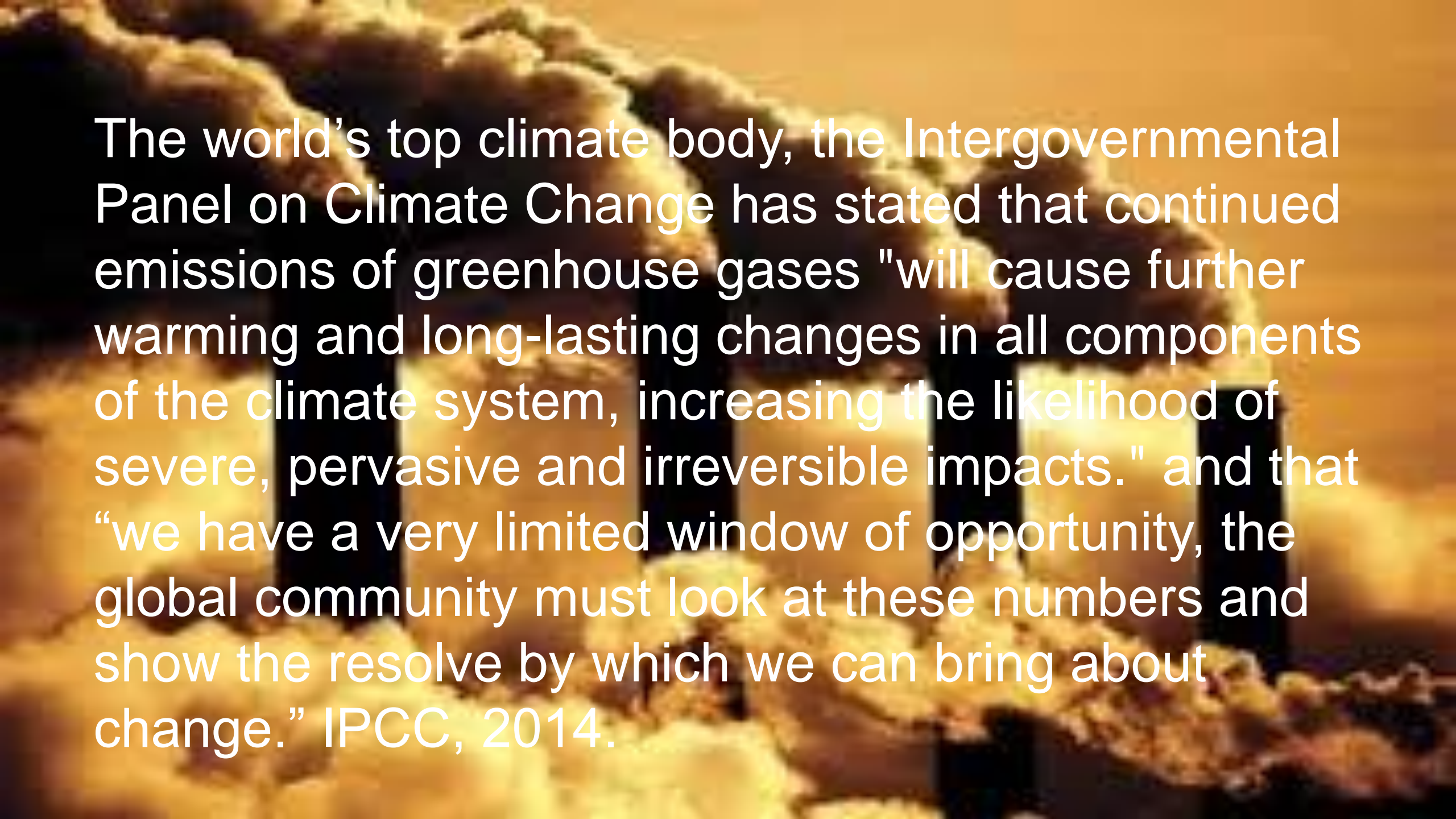
www.museschool.org

Tel: 818-880-5437

Diet and environment: wider context

- Carbon labelling in Europe
- Community projects - focus on local production and consumption
- Lord Stern 'vegetarian diet is better for the planet'
- Bill Gates – investing in low impact alternatives to meat 'beyond meat'
- Leader of the IPCC urged people to observe one meat-free day a week to curb carbon emissions





The world's top climate body, the Intergovernmental Panel on Climate Change has stated that continued emissions of greenhouse gases "will cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive and irreversible impacts." and that "we have a very limited window of opportunity, the global community must look at these numbers and show the resolve by which we can bring about change." IPCC, 2014.

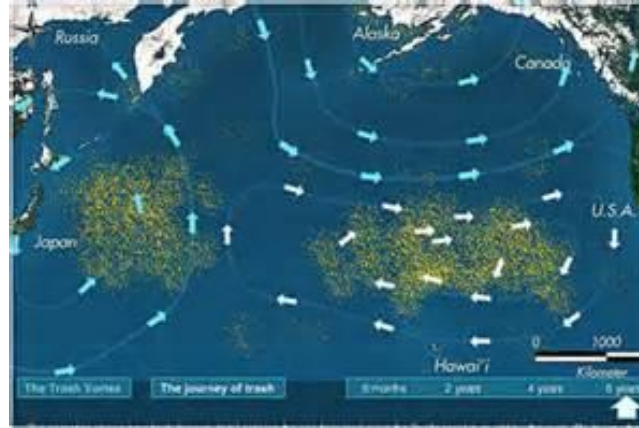
Climate policy

- To avoid 'run-away' climate change, a 25-40% reduction in greenhouse gas emissions is needed by 2020, ideally by 2017.
- Too late to reverse climate change by replacing fossil fuels with renewable energy – needs \$18 trillion and 20 years.
- “A substantial reduction of impacts would only be possible with a substantial worldwide diet change, away from animal products.” UNEP, 2010.



Take home tips

- Avoid food waste
- Use reusable shopping bags
- Buy products with the least packaging
- Buy local produce
- Buy from farmers markets
- Compost food waste (no cooked food, plants only)
- Walk/cycle to the shops
- Speak out – ask representatives for policy change
- Choose plant power!



Animals

Plants

Documentaries: PLANEAT & COWSPIRACY

[HTTP://PLANEAT.TV/](http://planeat.tv/)



[HTTP://WWW.COWSPIRACY.COM/](http://www.cowspiracy.com/)

