Where are we going with farming, research and the environment? A New Zealand perspective

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What's happening in New Zealand?

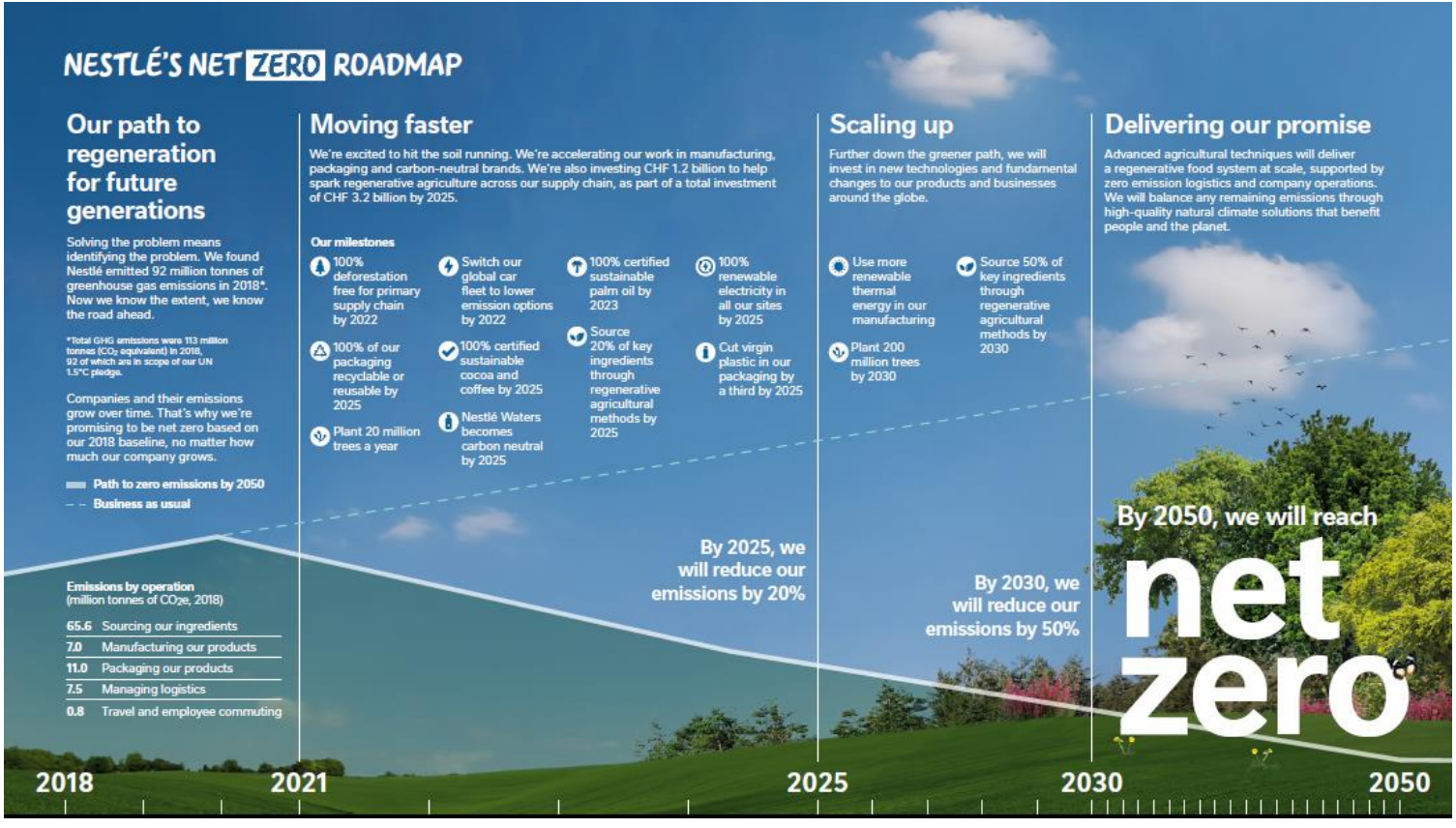
Water quality regulation increasing

- National Policy Statements
- Regional catchment targets
- National N fertiliser limit

GHG regulation increasing

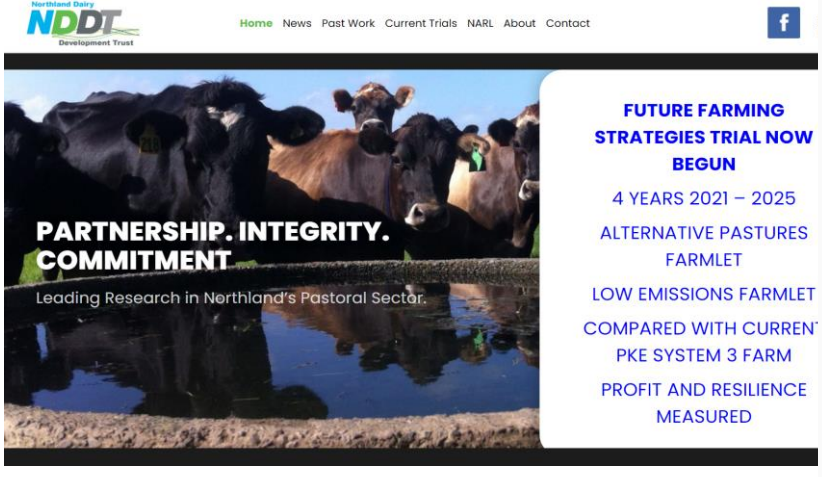
- Zero Carbon Act & Climate Change Commission Budgets
  - Total Emissions – GHG/ha or sector GHG total
  - *But Emissions Intensity – kg GHG/kg MS – is business*

Our customers are also setting targets



Farmers want to farm in better ways

The Climate Change Ambassadors are an important part of helping dairy



What are the regulated targets?

Water quality

- National targets still under debate
- Synthetic N limit 190 kg/ha
- Hinds – 25% less N leached/ha by 2030

GHG

- Methane – ‘split gas’ doesn’t have to go to Net Zero
  - 10% reduction by 2030
  - 22-47% by 2050 – science debate on warming
- Nitrous oxide – long-lived gas
  - Net Zero by 2050

How are we going to get there?

Voluntary Action

- Integrated Farm Plans
- Processor Incentive Programmes
- StepChange – Profit Up, Footprint Down
- Land use change – to forestry driven by C price

GHG Pricing – Sector led in He waka eke noa

- Price for Methane, Nitrous oxide
  - Credit for reducing emissions
- Credit for C sequestration

Regulation

Two big science challenges

Break the link between N inputs and N loss	• Re-organize the N cycle
Break the link between feed eaten and methane production	• Re-organize the rumen

How will science re-organize the N Cycle?

N management - existing

- Reduce N surplus – fertiliser and feed
  - GHG gains
- Re-organize the N cycle – urine patch
  - Off-pasture at critical times
  - Winter crops
  - Plantain

N management – pipeline

- Precision – e.g. Spikey
- New inhibitors

How will science break the feed eaten-methane link?

Methane reduction - existing

- Reduce feed eaten
- Methane Inhibitors
  - Bovaer/3NOP
  - Seaweed – *Aragopsis*
    - Bromoform

Methane reduction– pipeline

- Vaccine
  - High uncertainty, high potential
- Early-in-life rumen reset
  - Calf rearing phase
- Methane Inhibitors – agribusiness
- Genetics – low emission
- GM pastures

How will science help store more C on our pastoral farms?

C sequestration - existing

- Plant trees
- Protect and enhance existing natural forest/bush/scrub

C sequestration – pipeline

- Soil C
  - Biochar – charcoal from wood ??
  - Grazing Management and Diverse Pastures ??

Conclusions

Pasture based dairying has advantages	• Our competitors aren't standing still • Change is needed
We have options now	• Key to profit gains and GHG intensity • First step to reduce total emissions
Technology is needed	• Break the feed eaten-methane link • Re-organize the N cycle