

CONHUR

the new organic

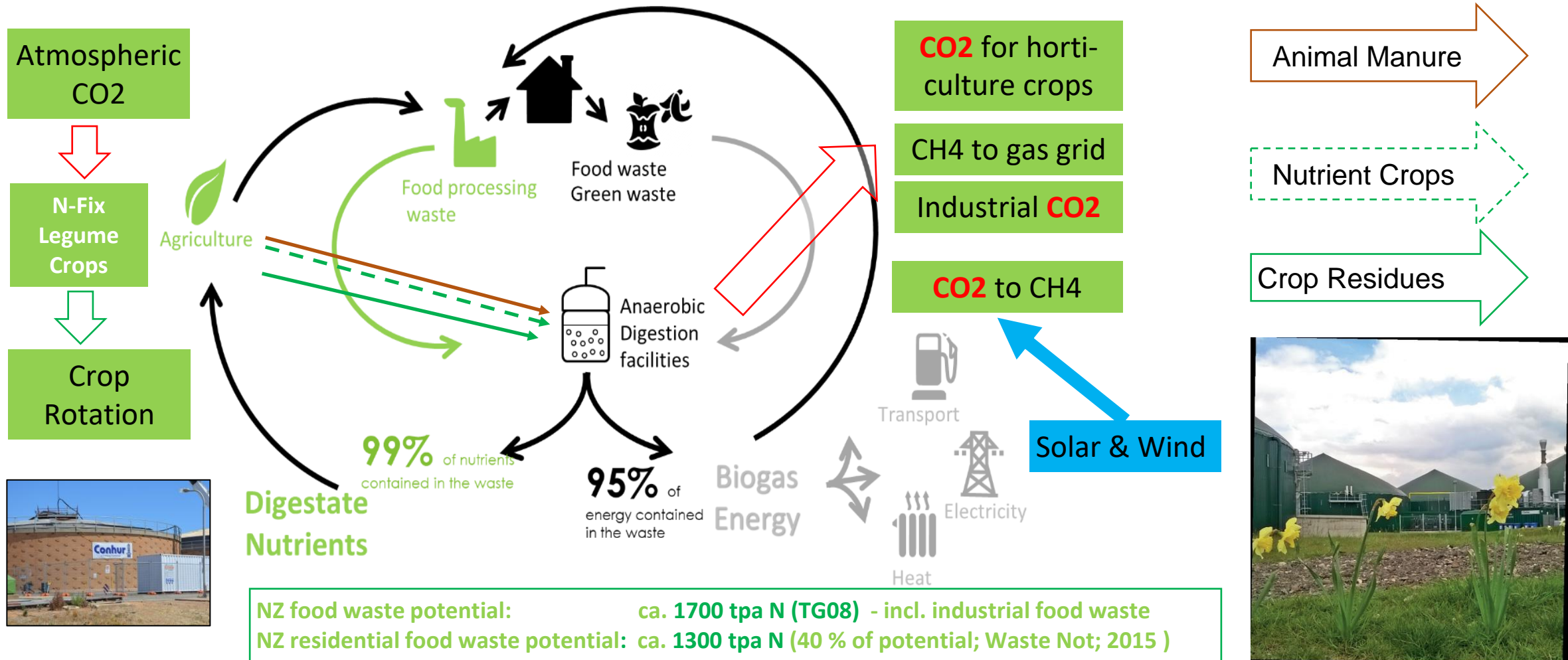
DIGESTATE AS A FERTILISER – CARBON AND NUTRIENT CYCLES

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2 December 2020



ANAEROBIC DIGESTION (AD) AND BIOGAS OPTIONS - IN THE CIRCULAR ECONOMY

- IEA Bioenergy: Task 37: 2018 : 8 The Role of Anaerobic Digestion and Biogas in the Circular Economy.
- IEA Bioenergy: Task 37: 2015 Nutrient Recovery by Biogas Digestate Processing.
- **BANZ (2020): Technical Guide 08 (TG08):** The production and use as biofertilizer of digestate from source segregated organic waste.

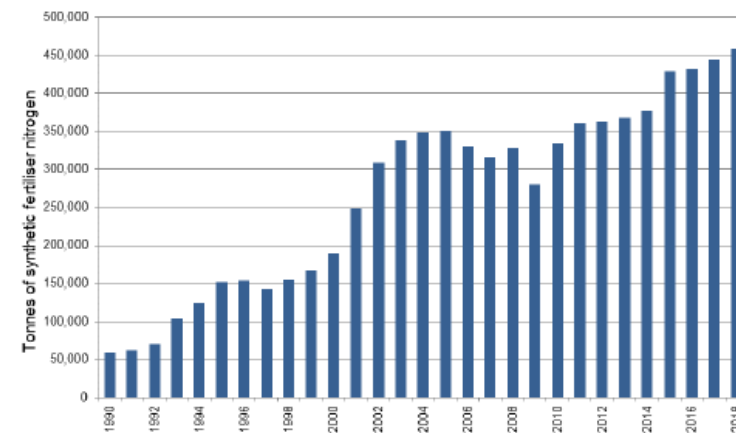


INDUSTRIAL ECOLOGY – EVOLUTION OF A FUNCTIONAL SYSTEM

- “Moving goal posts” – a future increase in the price of carbon will open “new doors”
- 1 ton urea has a “carbon foot print” of at least 0.75 t CO₂-e (up to 2.5 t CO₂-e if from China)
- 1 ton urea has 46.7 % ammonia-N (dairy farming = major urea fertiliser use in NZ)
- 1 ton of digestate ammonia-N fertiliser recycled from AD feedstock saves 1.6 t CO₂-e (and up to 5.3 t CO₂-e per cycle)

NZ Urea-N 1990 – 2018 (385,000 tpa N in 2018)

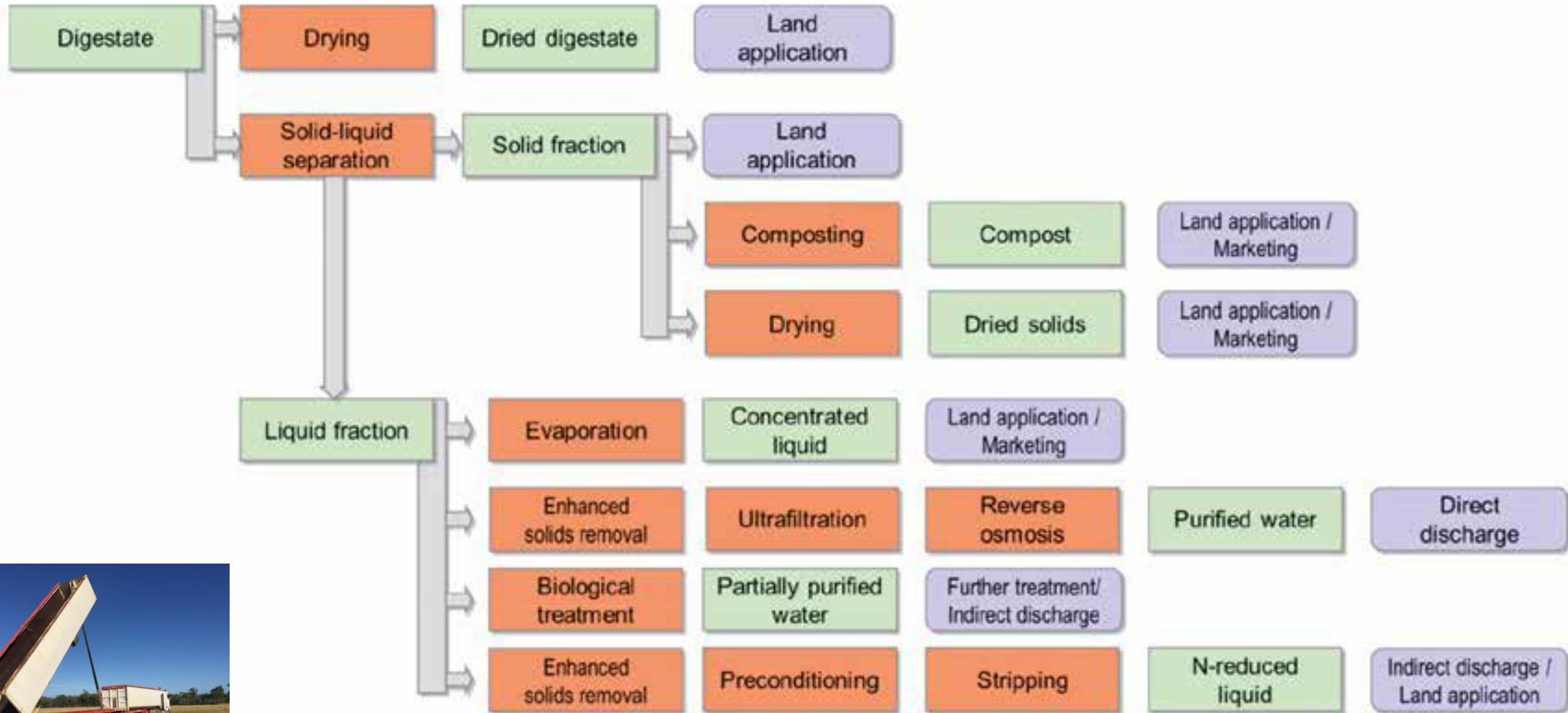
Figure 5.5.2 Synthetic nitrogen fertiliser use in New Zealand from 1990 to 2018



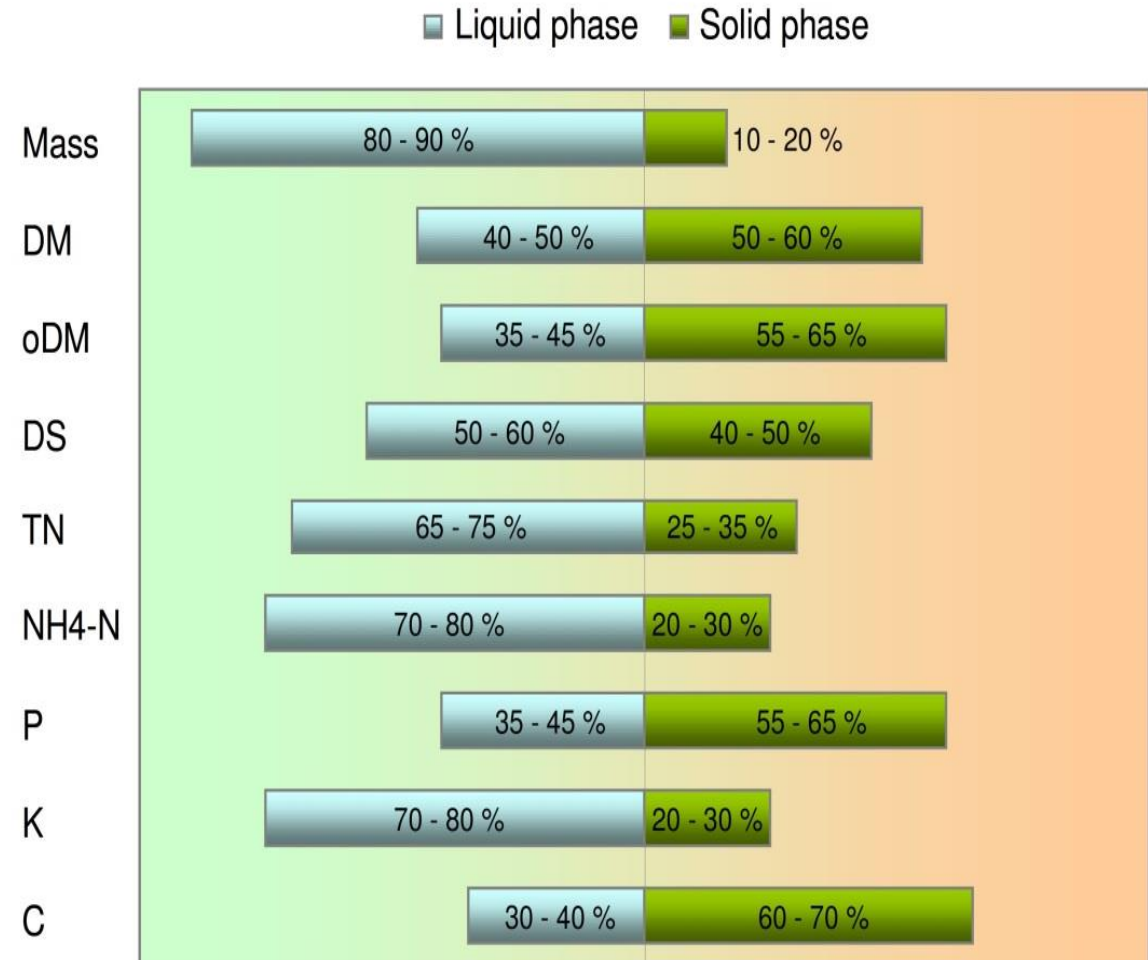
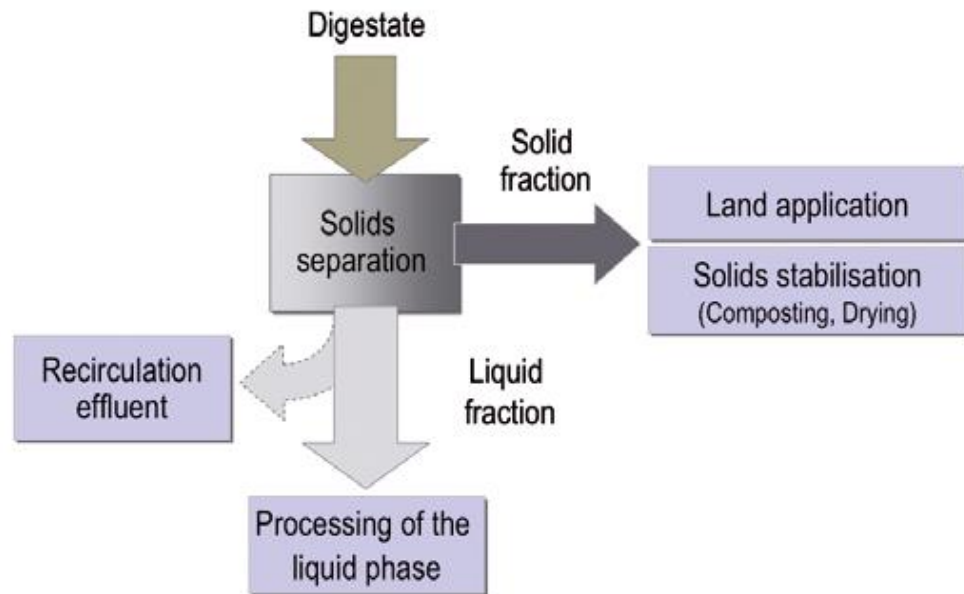
Source: Fertiliser Association of New Zealand



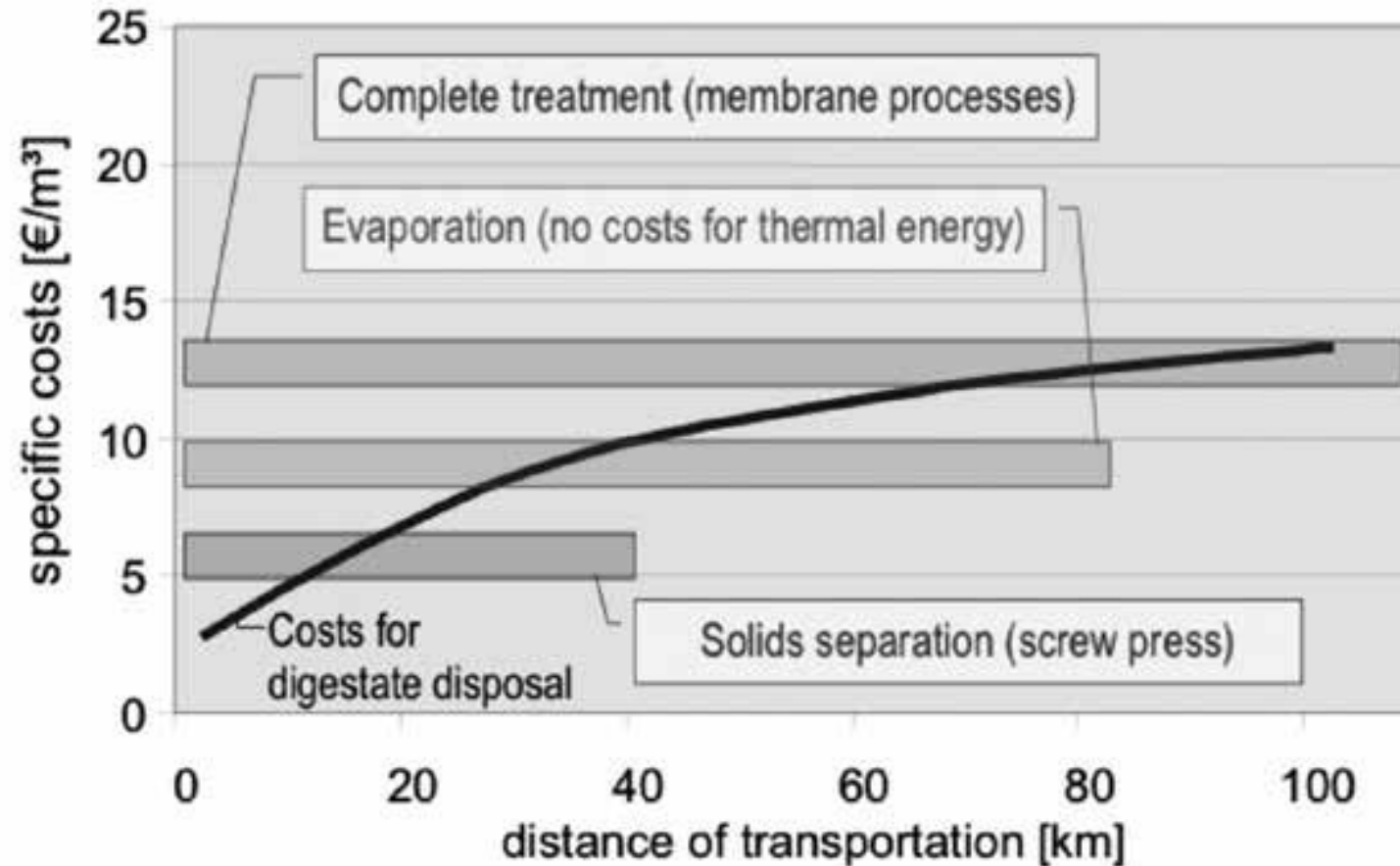
NUTRIENT VALUE RECOVERY OPTIONS



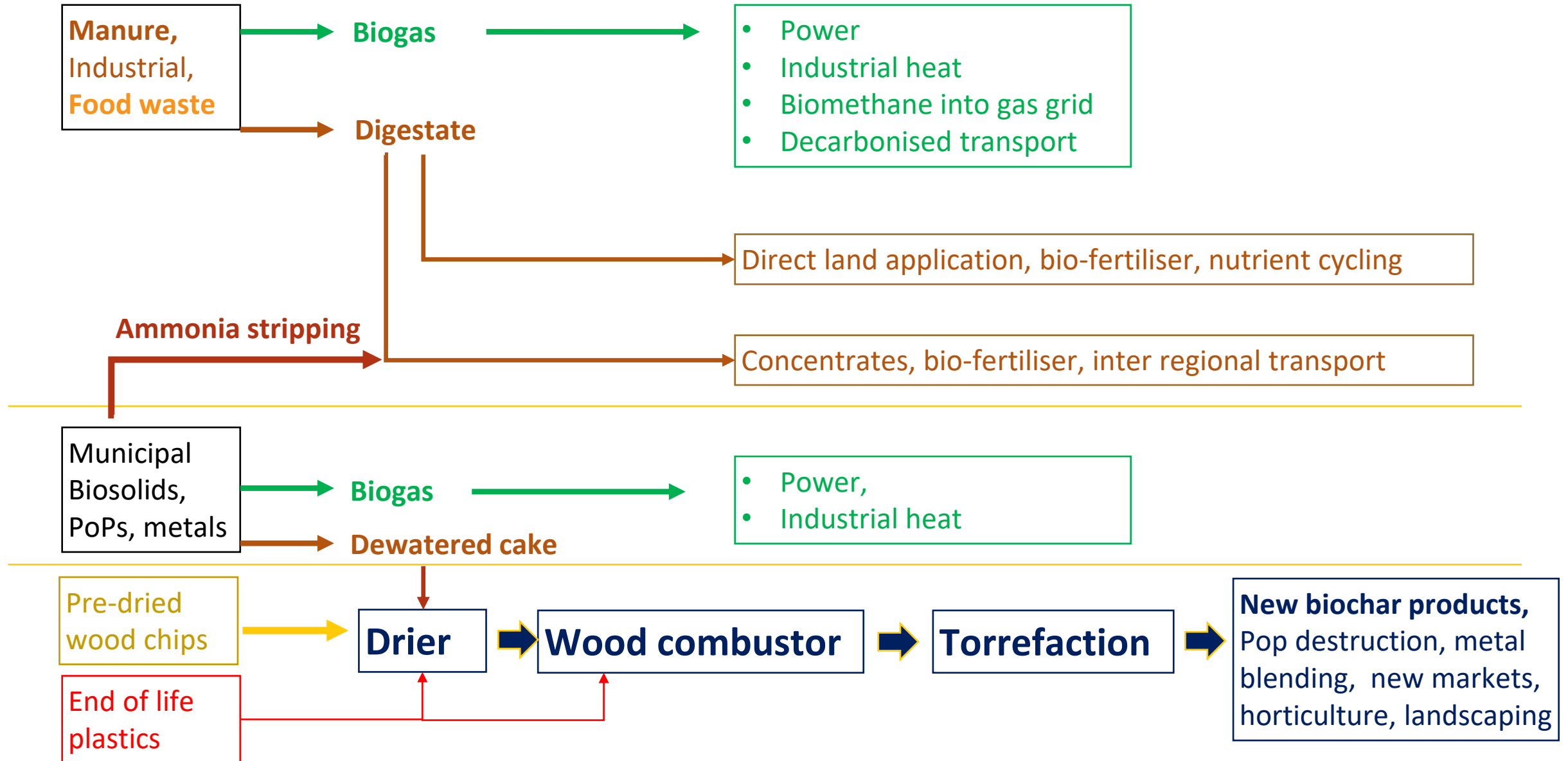
NUTRIENT VALUE RECOVERY – DIGESTATE SEPARATION



DIGESTATE NUTRIENT VALUE RECOVERY – PRODUCT TRANSPORT RANGE



DIGESTATE NUTRIENT VALUE RECOVERY – INTEGRATION WITH WWTP BIOSOLIDS



POTENTIAL USERS



INITIAL MARKETS OF BIOCHAR/ MINERAL TORREFIED SEWAGE SLUDGE

1. Flowers and Ornamental Trees (home and commercial)
2. High value orchards such as avocados and nuts etc.
3. Land remediation (PFAS)
4. Grass applications

MARKETS FOR SEWAGE SLUDGE/WOOD/MINERAL/NPK

1. Vineyards
2. Vegetables
3. Land remediation

SUMMARY

1. AD is key to nutrient and value recovery from organic waste
2. Safe and sustainable AD solutions are globally practiced (IEA endorsement)
3. Value products are biogas, digestate biofertiliser(s) **PLUS** industrial (“food”) grade **green** CO2
4. The **recycled** N-content replaces urea fertiliser and reduces GHG emissions
5. The **recycled** P-content replaces mineral phosphates
6. Specific AD feedstocks can be added to boost the urea replacement benefits of digestate
7. Solids recovery (screw press, decanter) partially separates N (liquid) from P (solids) nutrients
8. Land application of whole digestate is most cost effective (0-20 km)
9. Separation of P-rich solids and N-rich liquid improves commercial opportunities
10. Production of nutrient concentrates further improves transport range (0 – 80 km)
11. Ammonia stripping recycles N of WWTP biosolids and excludes metals and POP’s
12. WWTP solids can be recycled via a biochar/torrefaction route (P-content, carbon deposition)
13. Contact: Jurgen Thiele, AD Services Leader Australasia: Jurgen@conhur.com. +6427 2586376

VORTEX GROUP AND CONHUR BACKGROUND

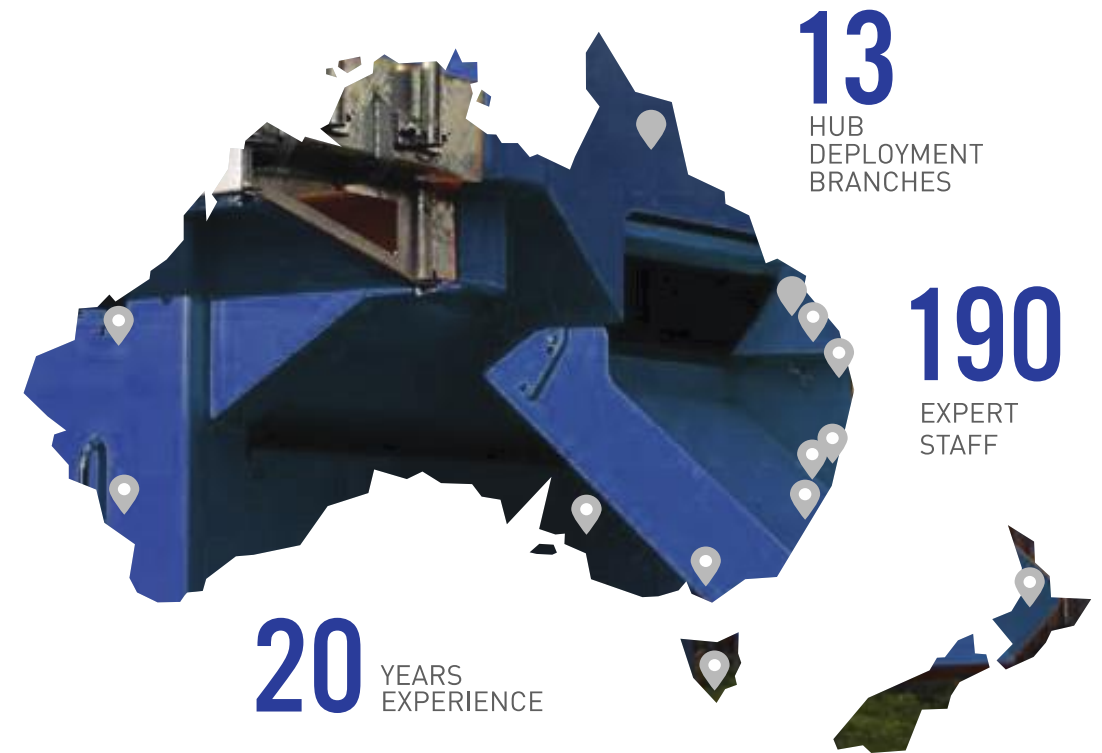
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With 200 staff across the group, Vortex employs engineers, technicians, scientists and other specialised trades people to offer our B2B customers access to the best and brightest and ensure we treat their projects as though they were our own. Delivering best value outcomes by employing the best people and empowering those people to access the best equipment on the market has been the corner stone of our remarkable growth over the past several years.



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NUTRIENT VALUE RECOVERY – RELATIVE COSTS

