

Water feasibility study for localised food production

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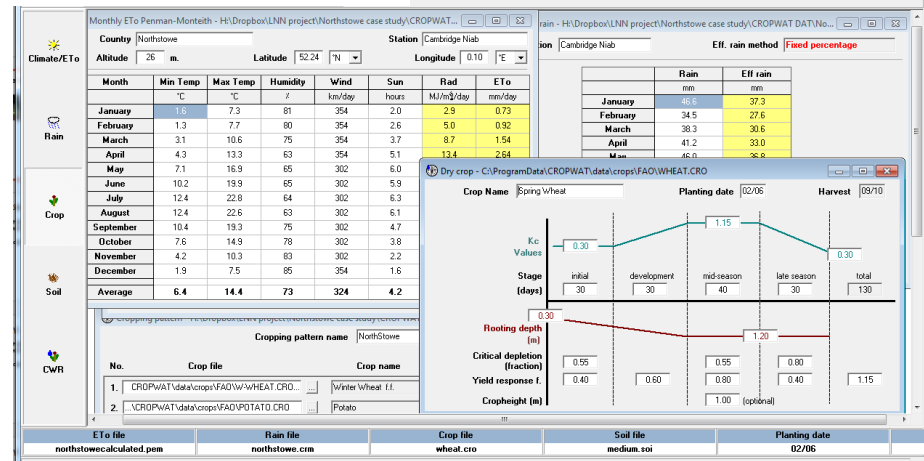
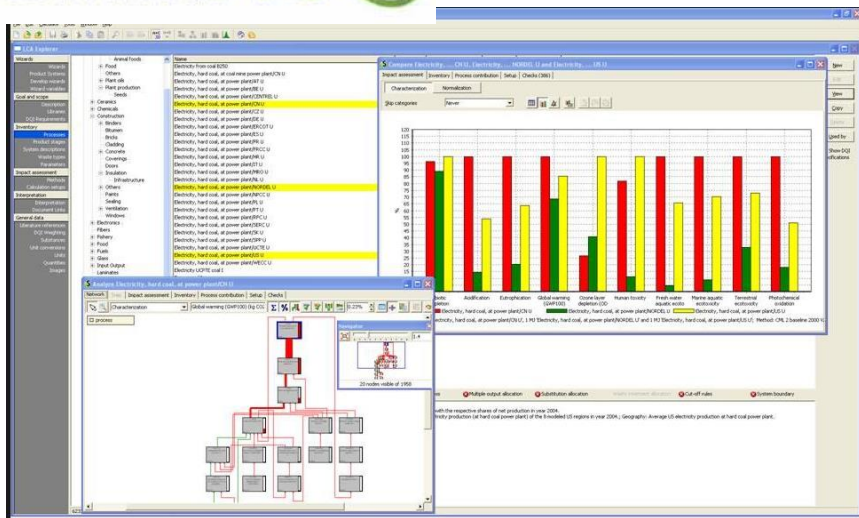
Objectives

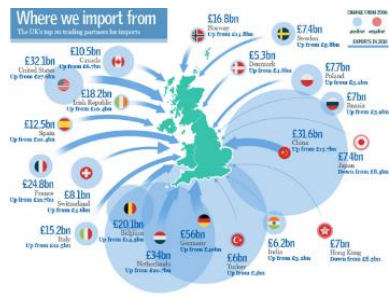
- Assess water demands in the context of localised production
- Develop application scenarios that address these demands to inform technology portfolio analysis for water processing, including those for optimising water-use efficiency
- Investigate graded water reuse and recycling opportunities among processes involved in food production chain
- Exploit synergies among localised/small scale water and energy technologies and systems for improved resource recovery

Evaluation of water, energy and carbon footprints

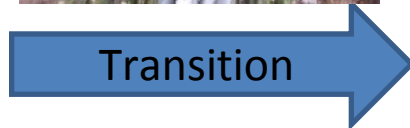
- **Cropwat** – water demand estimation in cultivation phase
- **Life Cycle Assessment** – assessment of environmental impacts (cultivation, manufacturing, packaging, transport)

SimaPro 8





Imported, processed food production



Locally produced/ processed food production



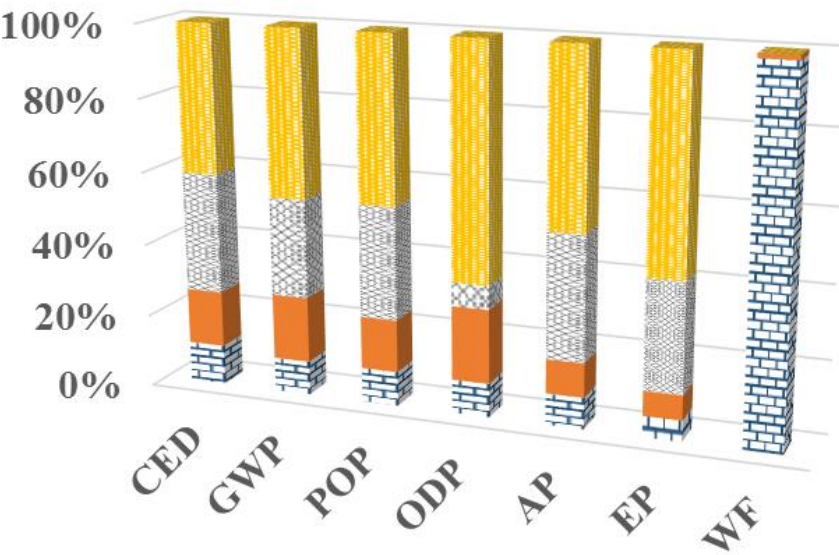
Water footprint of tomato puree/paste is almost **99%** for **cultivation** phase and around **1%** for **processing** phase

Product	World	UK	Oxfordshire	Cambridgeshire
Tomato fresh	214	12	13	13
Tomato juice, concentrated	1069	61	68	64
Tomato paste	855	50	54	52
Tomato ketchup	534	30	33	33
Tomato puree	713	40	45	43
Peeled tomatoes	267	15	17	15
Tomato, dried	4276	244	270	259

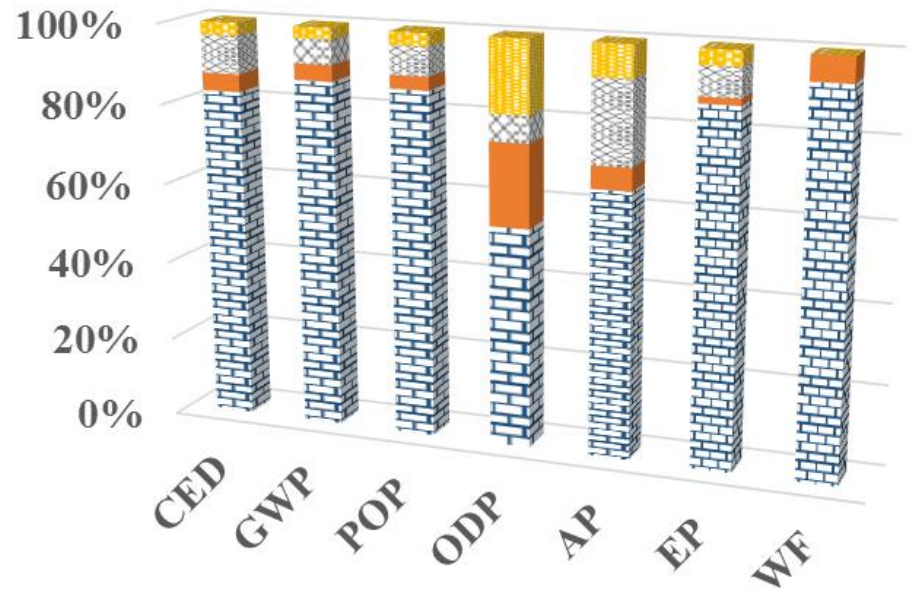
Environmental impacts

Break-down for all production

Cultivation
 Manufacturing
 Packaging
 Transport



Imported tomato paste

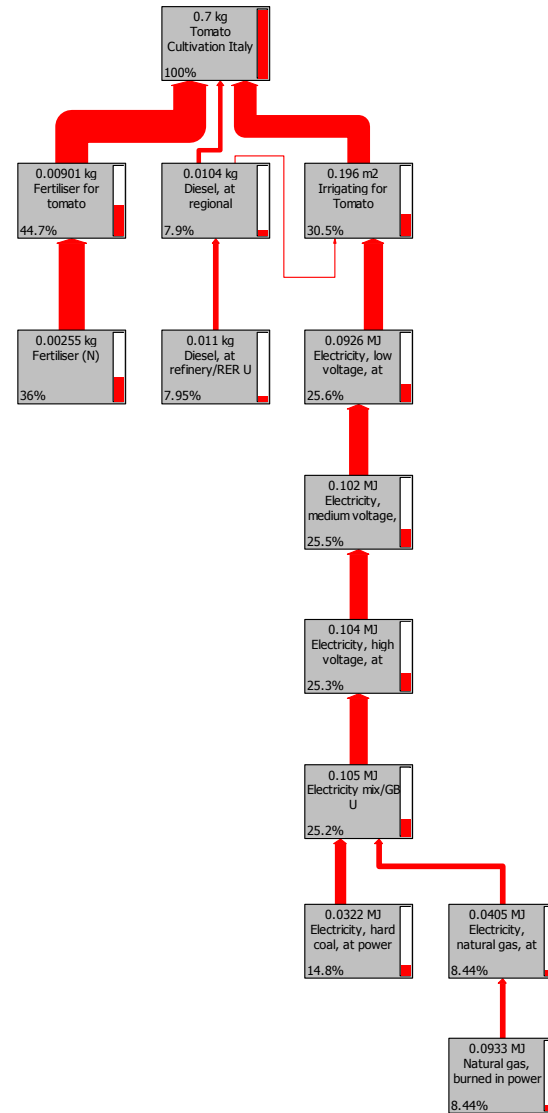


Locally produced tomato paste

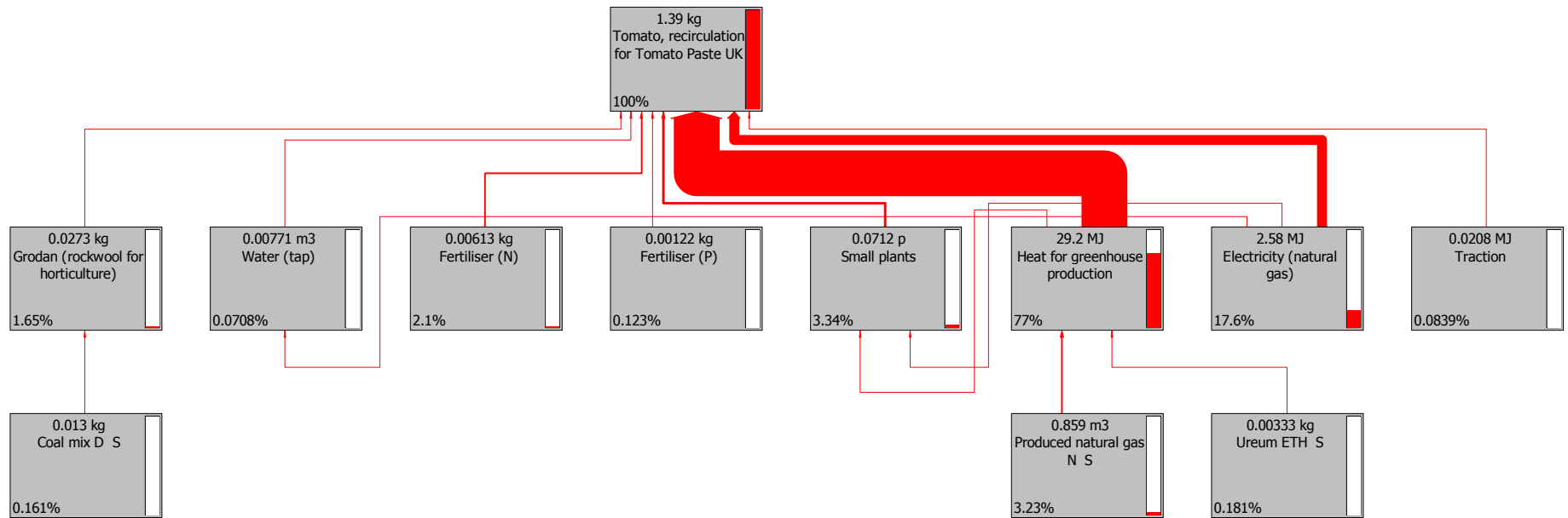
CED (Cumulative Energy Demand)
 GWP100 (Global Warming Potential)
 POP (Photochemical Oxidation Potential)
 ODP (Ozone layer Depletion Potential)
 AP (Acidification Potential)
 EP (Eutrophication Potential)

Contributing elements of GHG emissions for cultivation

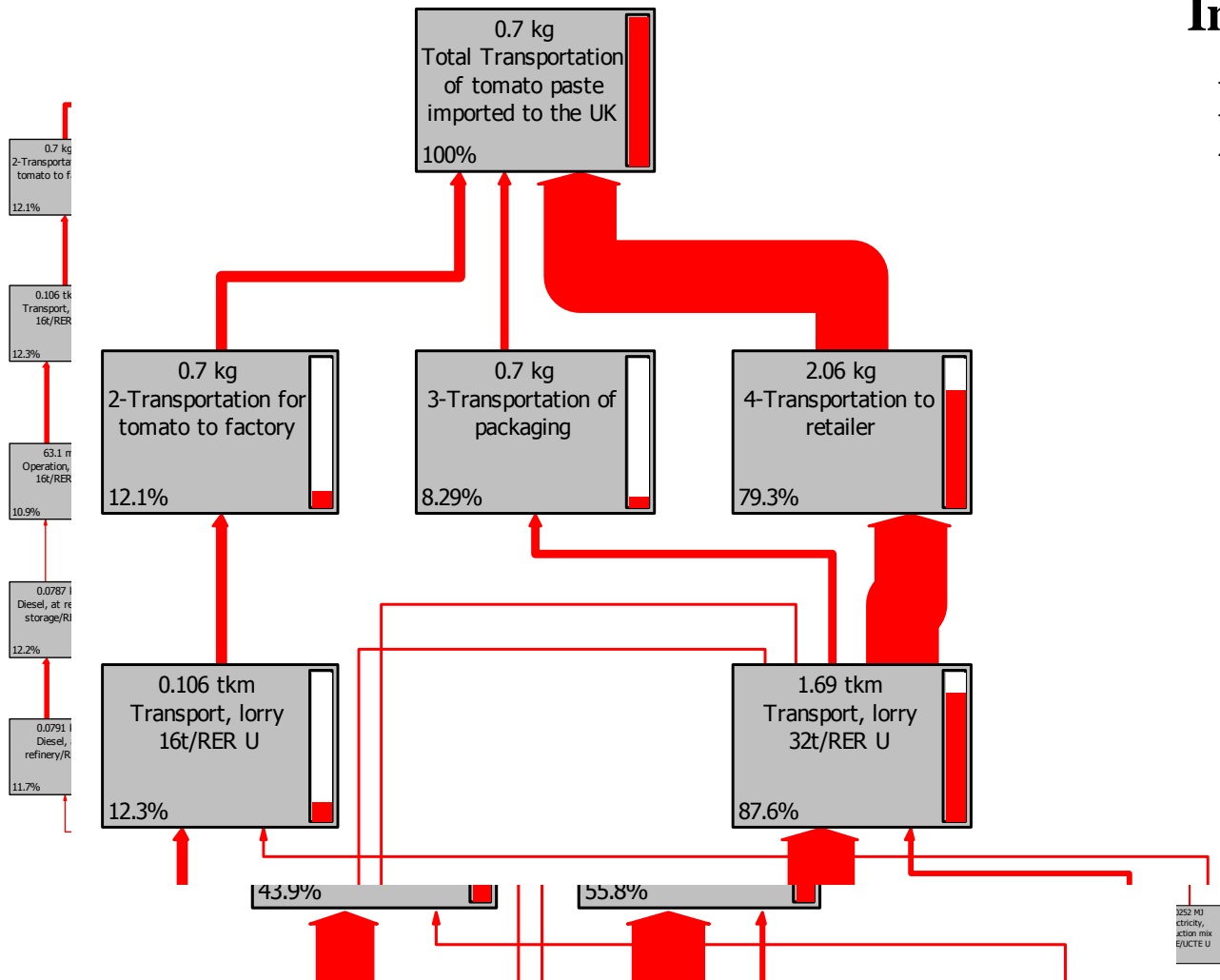
Imported Tomato paste



Contributing elements of GHG emissions for cultivation Locally produced tomato paste

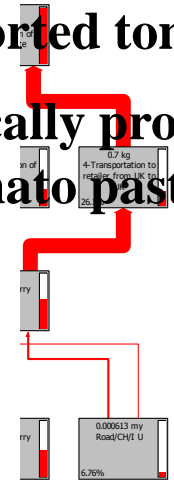


Contributing elements of GHG emissions for transport step



Imported tomato paste

Locally produced tomato paste



Locally produced tomato paste

Summary

- Water footprint is considerably small for local production, the energy, carbon footprints and some environmental impacts are high while some energy demand is offset by savings through reduced transportation of imported tomato paste
- The LCA provides an evidence base to take into consideration synergies and trade-offs between these constrained resources when deciding on local food production
- The high cost of agriculture and opportunities for using high quality arable land for other purposes may argue against production of some local food