IELab Applications for Life Cycle Assessment

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Initial presentation:

- IELab has flexibility built in for many applications to LCA. It should be straightforward to incorporate new data, manipulate existing data and reuse other people's data.
- The 'satellite accounts' datafeed system has been designed to facilitate the straightforward addition of new LCI data and also new LCIA models (e.g. once toxic emissions LCI is functional, new toxicity factors could be applied to it as they become available).
- The 'balancing by optimisation' approach enables flexibility with respect to how satellite data are specified (e.g. absolute data vs internal ratios vs emissions factors) – they don't have to fit a rigid mould.
- This flexibility has totally changed the meaning of IOA for LCA practice because it means that LCA practitioners are no longer 'stuck' with hard-coded IOA data, either at LCI or LCIA stage.
- There is huge potential for hybridisation within IELab by uploading process-based LCI data.

Participant-led discussion:

What are the requirements for data to be suitable for writing into a satellite datafeed?

- The dataset must be able to be expressed (usually this means disaggregated) in terms of the industry sectors (IOPCs) and regions (SA2s) of the root classification.
- It must also be additive (e.g. number of female workers is appropriate, percentage of female workers is not appropriate).
- It doesn't necessarily need to span the whole economy, as long as this is acknowledged (e.g. in Eora there is 'Indian child labour' which only applies to India; the same logic could apply for e.g. 'NSW biodiversity loss' or similar).

Applications to product footprinting (e.g. PAS2050) – what if it needs to audited?

- Two issues. 1) To conform to a standard, the user would need to use the appropriate metrics (e.g. emission types), and appropriate impact factors as specified by that particular standard. 2) Whether the standards allow for top-down methodology will be an ongoing discussion.
- Ultimately, the transparency and open-source nature of IELab would work in the favour of auditing because everything is clearly visible at each stage of analysis.
- It was noted that NCOS accounts based on IOA have successfully been audited by LCA practitioners in the past.

Have any satellite accounts been populated with respect to final demand (e.g. distinguishing between residential vs industrial water use)?

- Yes, the waste datafeed does this (ref. Jacob Fry).

What can we do, as IELab developers, to encourage uptake by the LCA community?

- It would be really useful to develop a set of 'standard products' (e.g. an IO table for Australia) that have a defined scope, set of constraints, satellites etc. The specifications could be agreed on by ALCAS and the table could be tagged 'ALCAS-specified' or similar in the portal, accompanying documentation could clearly set out the scope etc. in a way that practitioners can easily understand.
- Produce case studies demonstrating the power/advantages of IELab. Even a simple fictitious one could do the job. Maybe a case study of agriculture? And/or construction? Target presentation at the ALCAS conference(s) in November 2015.
- The results should be easy to interpret, not only in terms of what the footprint is but how it can be reduced. Process models allow detailed examination of the supply chain. Analytical tools like structural path analysis and production layer decomposition can give similar insights but we also need to take care not to 'overwhelm with information'.
- Several process-LCA software tools already have IO capability (e.g. SimaPro, OpenLCA). From a practitioner perspective, it would be great if we could export the 'standard tables' (above) for integration into those software packages. Conversely, those tools can output data in matrix form that could potentially be readily incorporated into IELab (Tim Grant can advise).
- The LCA community sometimes gets into unresolveable debates (e.g. attributional vs consequential) in which we end up with multiple accepted approaches. It would be great to be able to 'automatically' do process, hybrid, and pure IO analysis in parallel, based on the same underlying data, and see a direct comparison.
- Commercial aspects of using IELab also need to be resolved. Is it ready? When will be ready? What can/can't be done with it? Tim Grant's experience with SimaPro's business model could be useful for Tommy in developing an IELab business model.

Do we know any other data sources that could be added to IELab?

- AusLCI and other existing process data.
- Particulate matter (PM) – primary PM data sourced directly from NPI but could also include characterisation factors for precursors of secondary PM (e.g. ammonia).
- Fertiliser/nutrient (Nitrogen, Phosphorus, Potassium) accounts.
- National Performance Reports on Australian water utilities (managed by BOM; prev. NWC) – ref. http://www.bom.gov.au/water/npr/

Other points raised

- There are lots of ways in which the LCA community could add value to IELab. One of the most obvious is in adding the LCIA models and perspective which have been developed over many years internationally and in Australia.
- Some researchers are coupling fate modelling with MRIO (ref. Yuya Ono; also work being done by Oliver Jolliet's group(?)).
- LCA researchers are currently working on experimental approaches with GIS layering for mapping pollutants etc. IELab could even be used just for 'spatialisation' of direct impacts to inform such an approach.