Product System Hackathon Kickoff

April 2, 2019

EPA-lead project in collaboration with DOD sponsored by SEDRP-ESTCP

Objectives

- Create product system model (PSM) assemblers
- Identify, scour and link processes to provide background for the given foreground system
- Describe created PSMs (and gaps) in high level of detail
  - The completeness of the product system(s)
  - How well system meets data quality goals
  - How many separate product system models are present
  - Any attributes of assembled product systems that can inform there relevance

NOT Objectives

- Creating original unit processes (except bridge processes)
- Handling elem flow matching and performing LCIA calculations

Target Outcomes

- Tools/code to leverage, build on, by
  - DOD and other Federal LCA Commons contributors
  - All LCA practitioners
- Help to create the data pipeline
  - Demonstrate how we can leverage existing data/tools
  - Point out where improvements need to be made in data, metadata, and data systems to enable better product system models

Guidance

- Python 3 preferred for compatibility
- Need to produce openLCA JSON-LD compatible in the end (this can be via a conversion service)
  - olca schema format extensions are possible

- Try to provide data quality (info) for linkages

Roles

- Participants (Brandon, Chris, Michael)
  - Be creative, write and document code
  - Help summarize achievements, findings

- Organizer (Wes)
  - Provide initial direction, resources, initial foreground system creation
  - Communicate with all participants
  - Test all participant code
  - Help summarize achievements, findings

Phase I: Independent work stage

- 60 hrs between now and May 30
- ‘Independence’ is to enable creativity, exploit the existing data/methods/tool you know best, and to work at your pace
- Stage is non-competitive
- Communication/coordination with other participants is allowed
- Sharing resources is also permitted (for place see Code Management)

Code Management

- Create your own private repositories on github, bitbucket, or other git server of your choice. Invite organizer
- Do all coding until Jun 1 within your private repo
- On Jun 1, commit/push your private repository to your designated github/USEPA repo (TBD)
- Draw on any common resources, or post resources back to share https://github.com/USEPA/LCAproductsystemassembly_resources If we want to work on any standards, this is place to share. Note this repo is public/visible

Foreground-Data

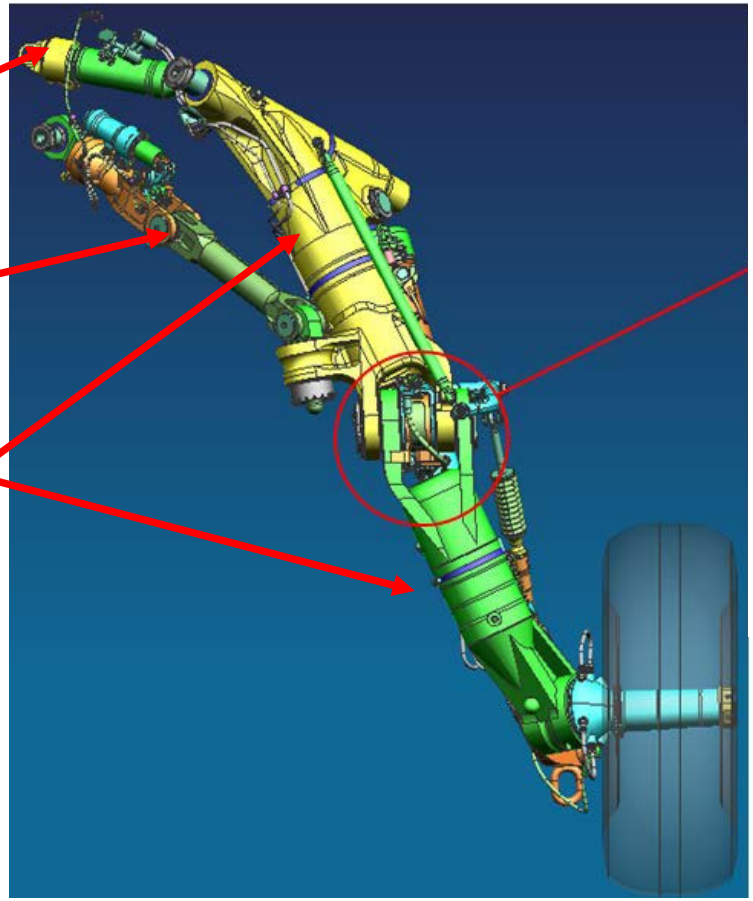
- Landing gear for an F-18 ‘Super Hornet’
- Separate data files for nose and main landing gear

Data

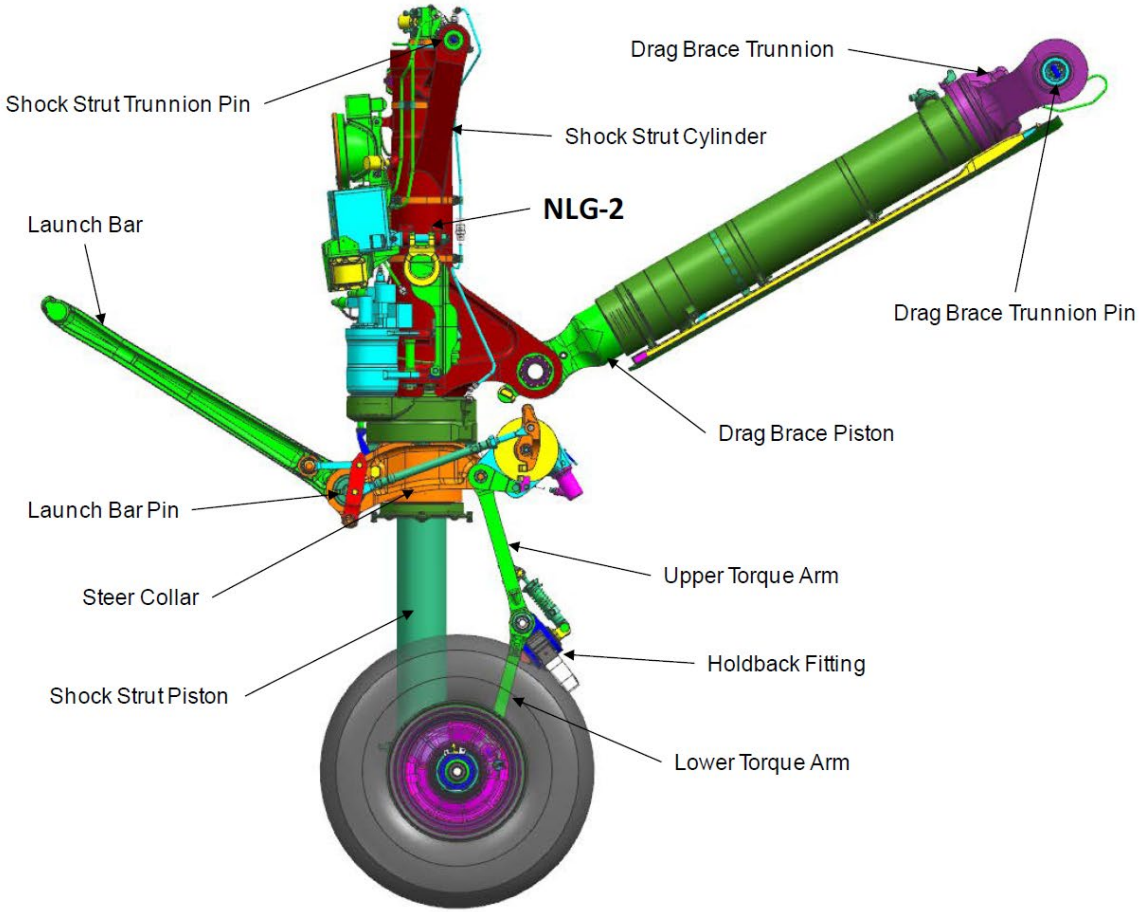
Retract Actuator

Side Brace

MLG Assembly
(All the rest)



Main Landing Gear



Nose Landing Gear
Retract Actuator Not Shown

Foreground-data – initial process creation

- Each subassembly as another process
- Process summary sheet
- Started issues

Foreground data – assumptions

- Nose and main assemblies assembled in CA
- All subassemblies assembled in USA
- Small parts (nuts & bolts) could be procured from anywhere

- Assume parts would be light weight, high performance (like **Aircraft Grade Titanium alloy, TC4**)

Data Quality Goals*

- Temporal: 2019
- Technological: TBD based on more info on composition of parts
- Geographical: Assume assemblies and subassemblies modeled in US
- Data Collection: The more market representation, the better

* as defined in EPA Guidance on LCA Data Quality

Background LCI

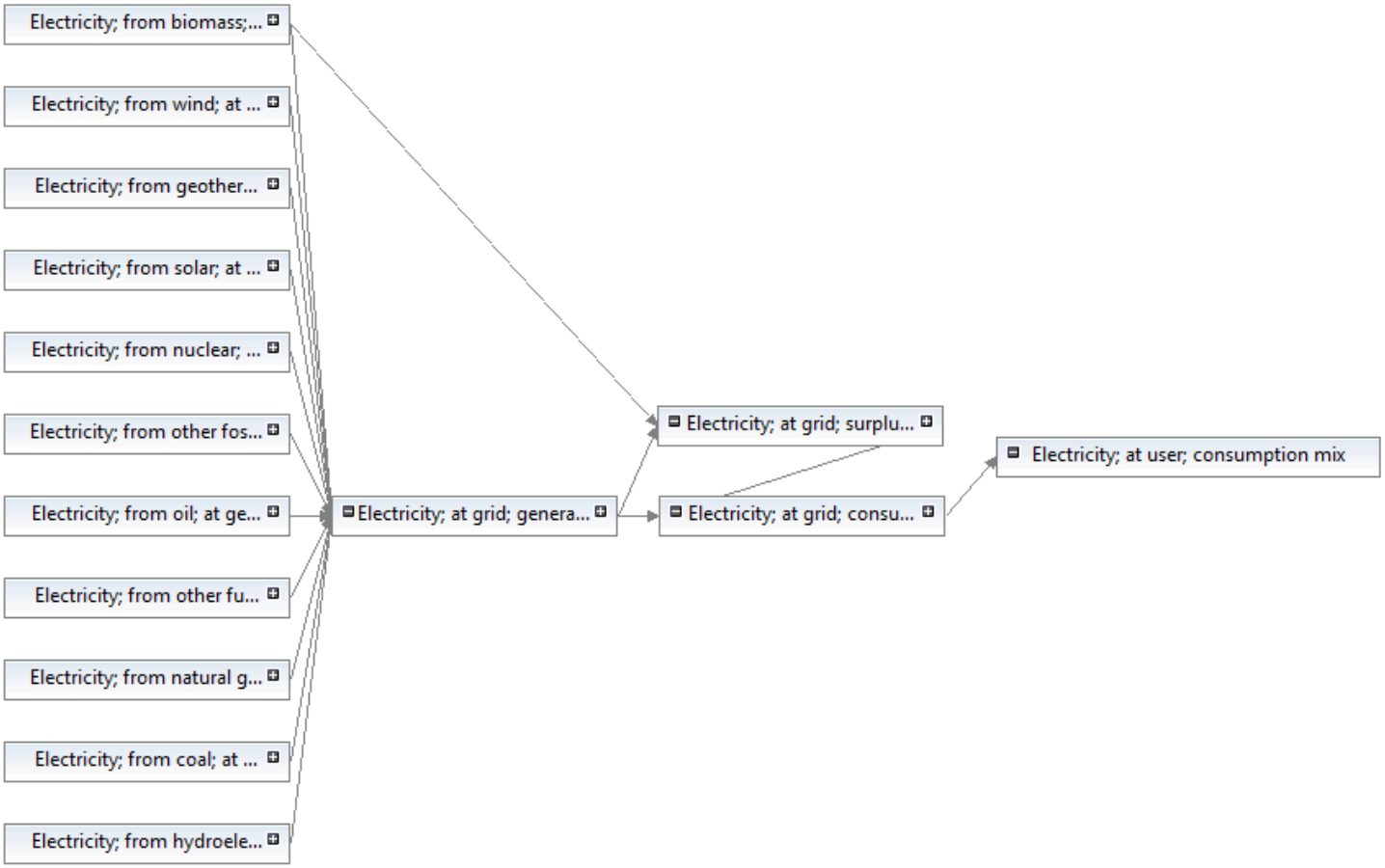
- Any LCI data are permissible, use of some LCI is encouraged

Preferred Sources

- US regionalized electricity LCI. See common resources
- USEEIO
- US LCI
- Other US Federal Agency LCI data

- Pending – Fed Commons data via the API

Electricity LCI



Other resources

- lci-dict – Trying to make dictionary building generic

- NAICS lookup example
  - Why? Federal LCA Commons process data will be organized by NAICS like USEEIO is currently

Next Steps – Phase 2

- Team Meeting in early June to share achievements, discuss challenges and gaps

- Goal: To produce a draft manuscript that describes the process and our accomplishments by the end of July

- Presentation: SERDP symposium Nov 2019 (Wes to present)
  - Feel free to present on this work at a conference – the poster or slides however will need to be cleared through our standard EPA procedures (~2-3 weeks)