



**U.S. LCI Database Project, Phase II:
Quarterly Report
January 1 – March 31, 2004**

Prepared for:

**National Renewable Energy Laboratory,
U.S. Department of Energy**

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April, 2004

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U.S. LCI Database Project Progress Report: 1st Quarter 2004

1 Introduction

This report covers the first quarter of 2004, and in the next section we present a brief overview of progress from January 1, 2004 through March 31, 2004. Updates to the work program and timeline are then discussed in Section 3.

2 Summary of Progress to March 31, 2004

2.1 Task 1: Development plan, reporting and project management

1. The development plan will be updated as necessary in this and future quarterly reports.

2.2 Task 2: Database format

1. The streamlined EcoSpold format spreadsheet has been modified over the quarter in conjunction with NREL and external experts to resolve issues of compatibility and stability and further enhance the spreadsheet.
2. The functionality of the website was tested and feedback was submitted to NREL.

2.3 Task 3: Additions to data development guidelines

1. A revised draft of the Database Project Development Guidelines was completed and posted to the website.
2. The flow nomenclature and elementary flow tasks are ongoing.

2.4 Task 4: Data collection

1. The following modules were submitted to NREL, including a streamlined spreadsheet, working papers and data details (mini-report) for each:

Primary Fuel Production

Petroleum refining

Non-Coal Fuel Combustion

Wood combustion in industrial boilers

Transportation

Diesel-fueled ocean freighter transportation

Residual oil-fueled ocean freighter transportation

Electricity Generation

Transformation Processes

Lost foam aluminum casting
Precision sand aluminum casting
Semipermanent mold aluminum casting

2. Specific fuels and energy database work was undertaken, as follows:
 - **Ocean Freight Transportation.** Data on ocean freighter fuel requirements was reviewed and the modules completed.
 - **Transportation Conventions.** The team decided to attribute input transportation instead of output transportation to unit processes for consistency across all modules. In other words, module boundaries are set at plant output gates. Modules were updated to reflect this convention.
 - **Petroleum Refining.** The petroleum fuels (gasoline, distillate fuel oil, residual fuel oil, LPG, and kerosene) were combined into one module, and the mini report for the petroleum refining module was updated.
 - **Wood Boiler Emissions.** A wood combustion module, completed and submitted to NREL early in the quarter, was revised and resubmitted.
 - **Electricity Generation.** The module for electricity generation was submitted to NREL. It includes fuel profiles for the average U.S. electricity grid and three regional electricity grids. This is a large module because it sorts EPA's vast EGRID database, which includes detailed data for the majority of electricity generators in the U.S.
 - **Precombustion.** Precombustion calculations have been completed and have been put into the streamlined EcoSpold spreadsheet. The precombustion mini report is currently being reviewed to ensure that it provides a comprehensive and coherent discussion on the precombustion calculations. This module will be submitted to NREL by the middle of April.
 - **Alternative Fuels.** The biomass module is nearing completion. The working paper and mini report have been completed for this module, but the internal review and EcoSpold spreadsheet have not been completed. A completed module will be submitted to NREL by the middle of April.

Specific work on the VRP (Vehicle Recycling Partnership) data on metal casting processes were as follows:

- **Aluminum Casting Modules.** Data for three aluminum casting processes were formally approved by VRP. The mini reports for the three processes were written by Franklin Associates and approved by VRP. Modules for the three processes were submitted to NREL.

- **Iron Casting Data.** Data for two iron casting processes were received from VRP. Franklin Associates has begun putting these data into the streamlined EcoSpold spreadsheet.

Specific work on materials used in the manufacture of automobiles/other durables and building and construction products was as follows:

- **Steel.** Athena Institute data on steel production generally, and for the U.S. specifically, was compared with data from a variety of other North American sources. Discussions were initiated with representatives of the industry to assure industry agreement with data prior to posting.
- **Structural Wood.** Work continued on the adaptation of CORRIM project wood data to the streamlined spreadsheet format, starting with plywood and lumber and continuing with OSB and Laminated Veneer Lumber.

2.5 Task 5: User's guide

1. The user's guide was revised to reflect changes in the format.

3 Work Program Elements and Schedule

Due to budget constraints, work on the project will essentially be stalled in the upcoming quarter.

Some work that is already committed will be finalized in the beginning of the second quarter of 2004. Work currently ongoing to finish the standard substance nomenclature system and the elementary flow reporting guidelines is scheduled to be completed by the end of April 2004.

Table 1 shows the delivery dates and progress for upcoming modules. Precombustion data are currently being finalized, and are expected to be completed in April 2004. The biomass module will also be completed in the second quarter of 2004. Limited work will continue on the adaptation of existing Athena Institute databases. The CORRIM data will be finalized in the streamlined spreadsheet in the second quarter of 2004. Finally, the Vehicle Recycling Partnership has recently provided iron casting data, which will be reviewed and formatted for the Database Project in the upcoming quarter.

Table 1: Progress and Delivery Schedule for Unit Processes

FUEL PRECOMBUSTION	Nearing completion	4/30/2004
ALTERNATIVE FUELS		
Hydropower	Postponed	
Biomass	Nearing completion	4/30/2004
Wind	Postponed	
Solar	Postponed	
Geothermal	Postponed	
MATERIALS USED IN THE MANUFACTURE OF AUTOMOBILES/OTHER DURABLES		
Steel	Currently being researched	
Aluminum Production	Research beginning	
Plastic Resins - Basic Polymers	Work at preliminary stages	
BUILDING AND CONSTRUCTION PRODUCTS		
Structural Wood	Nearing completion	4/30/2004
Structural Steel	Currently being researched	
COMMODITY CHEMICALS/MATERIALS		
Limestone Mining	Postponed	
Soda Ash Mining	Postponed	
Salt Mining	Postponed	
Chlorine/Caustic Soda Production	Postponed	
TRANSFORMATION PROCESSES		
Iron Casting	Currently being researched	6/30/2004
Steel Stamping	VRP currently collecting data	

Note: Shading indicates 3rd party data production effort.