Simplified Case Study for EUROS™ EIL Software

A case study for Time Travel Systems (TTS) *energy use reporting and optimization* software involves a local bakery. The firm name California Calories Bakery (CCB) shall be used in lieu of the bakery's real name from which actual data was obtained.

CCB has a single location where baked goods are made. CCB produces loaves of bread, muffins and cookies. CCB uses several resources for production, including a mixer, an oven, and a baker. Everything is baked and sold from the premises, so there is no shipping involved. CCB also has office and HVAC operations that use energy.

TTS software is essentially a user-friendly database system. CCB information regarding products, batch size, recipe steps, processes, equipment and manufacturing resources are entered in various tables of the database that relate to each other (see Figure 1). For example, each recipe step involves at least one process and one resource. The process requires time at its resources, and each resource consumes a certain amount of energy per hour. A table including energy sources and their costs can be included.

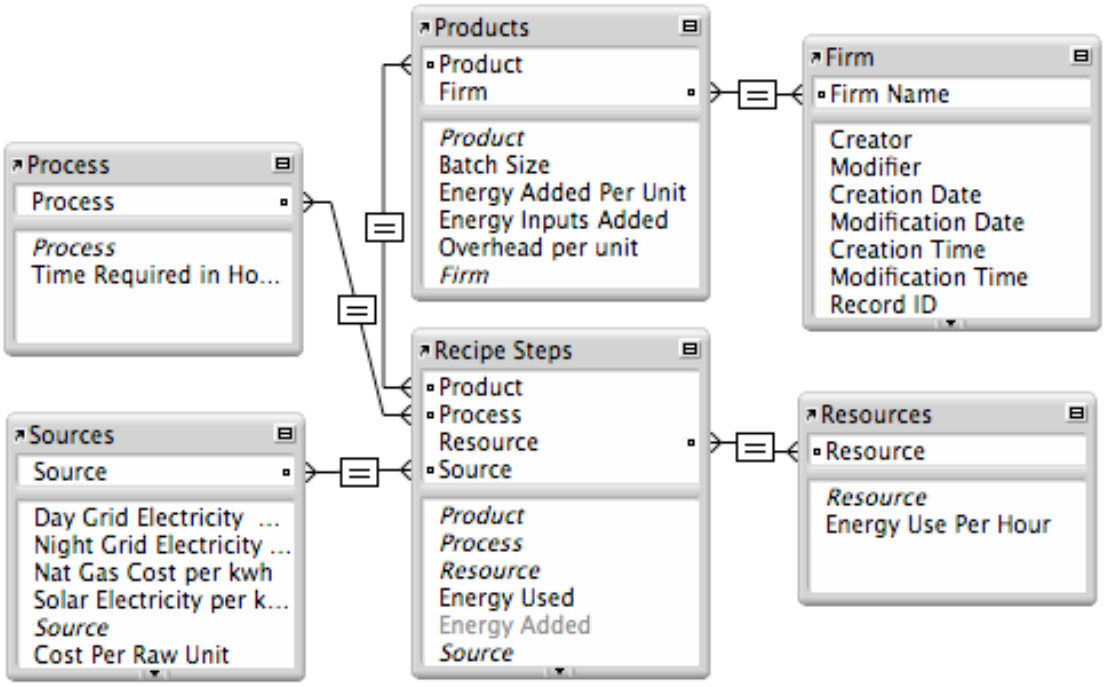

Figure 1—Simplified Entity-Relationship view of database used for software

A gross Energy Added figure is then automatically calculated for each batch of the product (see Figure 2). Since there are multiple units of product per batch, Energy Added is further divided to deduce Energy Added per unit of product.

Data regarding overhead energy use, in this case for office operations and HVAC, is entered and divided by quantity of products using a rational weighting system such as number of batches. That amount of overhead energy use per unit of product is calculated and added to the gross Energy Added per unit. Thus the Energy Inputs Added figure includes both direct and indirect energy used by CCB to produce a loaf of bread.

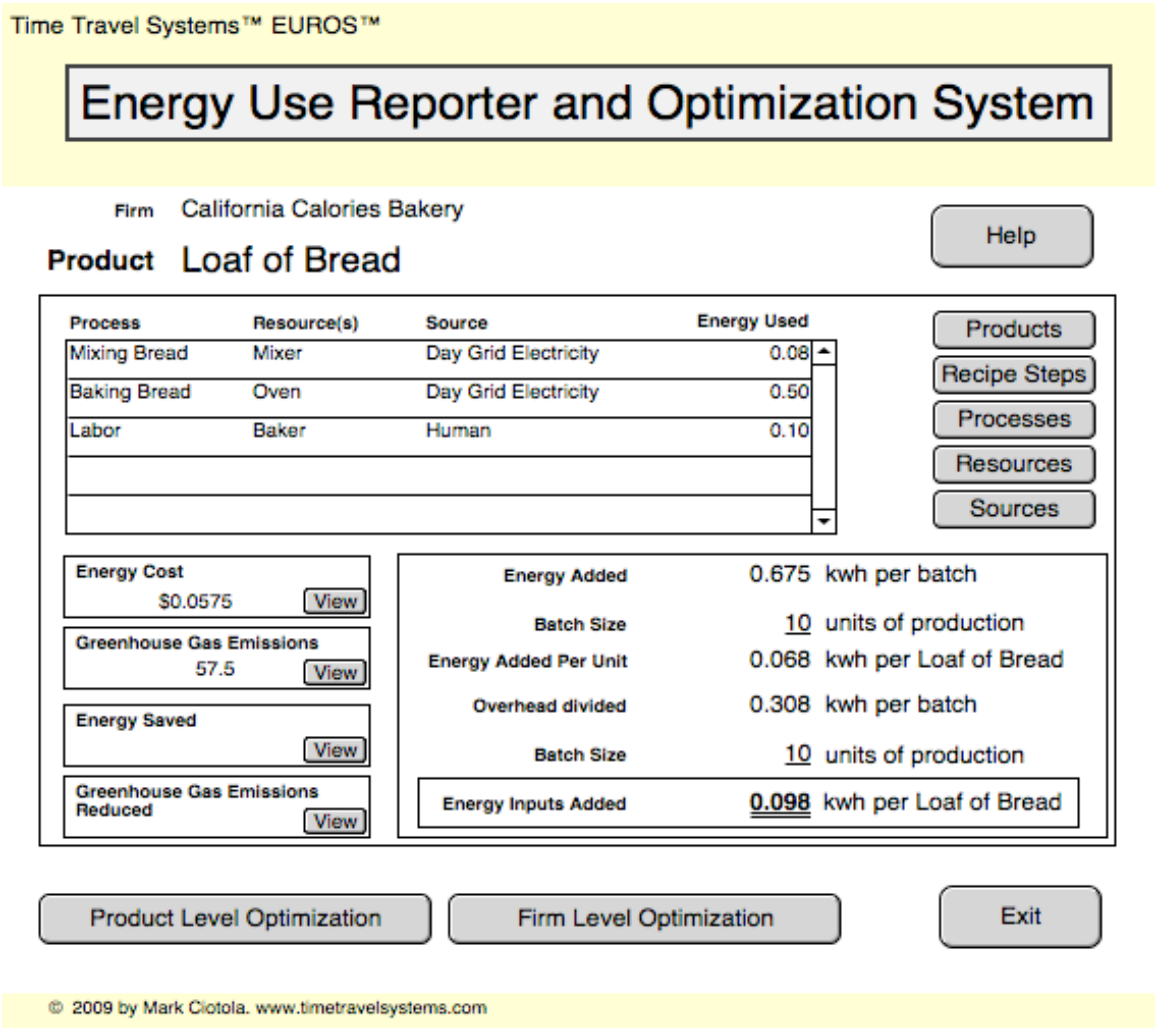

Figure 2—Screenshot of software showing Product view for bakery example

Now that the Energy Inputs Added per loaf of bread is known, then packaging for loaves of similarly produced bread can contain an Energy Input Label (see figure 3). If the energy used to produce the raw materials such as flour are known, the label can read "Total Energy Inputs"; but here, only the energy inputs of CCB are known, thus labeled as "Energy Inputs Added".

Energy Inputs Added
by CCB for this product:
0.98 kwh
20% from solar

Figure 3—Energy Input Label to be placed on packaging for loaf of bread

When additional information regarding energy sources and processing options are entered, it is possible to use the optimization functions to maximize energy efficiency and minimize energy costs. Such optimization can be complicated at the firm level, but can be easy with this software.

Note: The original software and data have been simplified and revised for this example.