Snapshot Report

Developing a sustainability assessment framework and strategy

Developing a sustainability assessment framework and strategy for the TFI US supply chain (stage 1 of 3)

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Project Description

Thomas Foods International (TFI) is a family-owned Australian meat supply business with offices in Australia, the United States, Asia and Europe. TFI operates two abattoirs in eastern Australia that export beef primals and bone-in lamb to their U.S. facility in Swedesboro, New Jersey for further processing and sale in the U.S. domestic market. The Swedesboro facility also packages poultry, red meat and non-meat products, both from imported sources from around the world, and domestic supply within the USA. Facility operations produce warehoused items and products that undergo processing prior to packaging for customers. With increased consumer demand for sustainably produced products, TFI aims to be ahead of the curve through being transparent and accountable, and contributing to the reduction of the environmental footprint of the meat sector.

In this project, TFI sought to understand their current baseline emissions and impacts of their US post-port operations for customer reporting, and to develop a sustainability reporting strategy to meet the current and future needs of the US market. Current customers require reporting of GHG emissions and other key impact areas such as water and waste for purchased products, providing the initial impetus for action.

The operational scope covered in this report is:

- Input meat for processing.
- Emissions generated from post processing and warehousing (scope 1 and 2 emissions).
- Emissions associated with purchased inputs for post-processing and warehousing (scope 3 emissions).
- Emissions generated from meat prior to arrival at the facility (scope 3 emissions).
- Upstream transportation of product (scope 3 emissions).
- Staff commuting (scope 3 emissions).

Following the GHG baseline assessment, a review of the current company SMART Goals (Specific, Measurable, Achievable, Realistic and Timely) for emission reduction was conducted. A hotspot analysis of TFI's post-port production was used to determine potential revisions to these goals in conjunction with TFI staff. Further consideration, including cost-benefit analysis will be undertaken into the supply chain emission reduction strategy in 2022/2023.

SMART goals assessed in this report include:

- Increasing energy productivity by 10% in relation to sales by 2025
- Implementing 25% renewable energy (or 2,700,000 kWh) through solar PV by 2025 (other renewable energy such as biogas generation will be assessed).
- Reducing 25% of waste to landfill by 2025.

Other TFI goals assessed in this report include:

- Measuring rendering in 2021 and identify opportunities to decrease rendering (assisted by the data collection and analysis required within the baseline report).
- Researching the availability of local composting (this project will provide a desktop assessment of the GHG emissions associated with composting rendering material).
- Continual review and testing of emerging sustainable innovations in food-grade packaging (implications for GHG emission will be assessed briefly).
- Support for the MLA goal of carbon neutral beef production by 2030 (no requirement to report as part of post-port operations).
- Assessing impacts of grazing acreage and the potential impacts of carbon sequestration.

The project objectives are:

- Stage 1 - Baseline assessment:
  - Deliver a carbon, water, energy and waste footprint of the post-port operations of identified meat products for Thomas Foods International.
- Stage 2 - Strategy to meet international market requirements (subject to stop/go):
  - Assist TFI to refine targets and a reduction strategy to meet US customer requirements for identified meat products.
- Stage 3 - Develop a framework to improve data collection, monitoring and reporting (subject to stop/go):
  - Develop a sustainability framework for the company to meet future customer requirements; improve data capture and reporting to meet company and customer needs and implement this in the TFI supply chain for reporting in 2022 and 2023.

Project Content

This project completed a cradle-to-market carbon, water, energy and waste footprint (scope 1, 2 and 3 emissions) for the post-port operations of TFI's Swedesboro facility. All activities from 'upstream transport' to 'final product ready for distribution to customers' were included in the assessment. We report total emissions using reference units that are aligned with the post-processing stage. Total emissions were reported as metric tonnes of CO_2-e, which aligns with customer reporting requirements.

The study developed a carbon account for the enterprise, reporting scope 1 and 2 emissions and total scope 1, 2 and 3 emissions. An assessment of direct energy and water use was also conducted, along with an assessment of municipal solid waste (MSW) production. These indicators align with industry standards and previous reporting together with the reporting guidance of key customers.

Climate change impacts were modelled as the amount of greenhouse gas emissions (GHG) throughout the supply chain using the business accounting framework (scope 1, 2, 3 emissions). The impacts were then converted to carbon dioxide equivalent units (CO_2-e) for 100-year global warming potentials (GWP_{100}) using AR4 values of 298 for N_2O and 25 for methane (Solomon et al. 2007) which aligned with U.S. EPA reporting (U.S. EPA 2021b). Emissions were disaggregated into scope 1, scope 2 and scope 3 sources according to the GHG Protocol (Ranganathan et al. 2004).

The study determined direct energy. The energy assessment was based on an inventory of all energy sources used in the processing facility and determining energy content (in megajoules – MJ). Energy demand was reported separately for fossil and renewable sources.

The water assessment was based on water meter readings at the facility and included water use for cleaning and general purposes. Annual consumption of water supplied by American Water was available for FY21. This assessment represented direct water use by the processing facility.

The waste assessment was based on the total weight of mixed MSW for FY21. The weight of recycled cardboard and plastic was not included in the assessment of waste due to the diversion of these items away from landfill.

A screening analysis was conducted to investigate possible options for emission reduction. This included assessment of the major scope 1 and 2 emissions sources with the goal of reducing emissions reported to TFI customers.

Project Outcome

This report provides a carbon footprint and an environmental impact assessment for Thomas Foods International's (TFI) meat post-processing facility in Swedesboro, New Jersey for the 2020 – 2021 financial year (FY21). The company aims to i) benchmark the carbon, water, energy and waste footprint of this operation for the 2021 financial year for reporting against customer requirements, and ii) identify options to reduce impacts into the future, and specifically to update the company SMART goals.

The assessment followed carbon accounting principles outlined in the Greenhouse Gas (GHG) Protocol for business accounting. Scope 1 and 2 emissions were reported based on primary data, and scope 3 emissions were estimated based on records of purchased inputs. An assessment of on-site energy, water and waste production was also conducted.

The annual GHG business emissions (scope 1 and 2) were 3,769 metric tonnes of CO_2-e, while the operation carbon footprint (scope 1, 2 and 3), was 1,401,773 metric tonnes of CO_2-e. Scope 3 emissions were dominated by purchased meat and to a lesser extent, transport.

Of the scope 1 and 2 GHG inventory, the majority of impacts were from grid electricity, which accounted for 50% of GHG emissions. Other major contributors to GHG emissions were estimated leakage of refrigerants R-505 and R-404A, at 24.6% and 19.3%, respectively.

The enterprise used 20,437,267 MJ of direct fossil energy (i.e., fossil derived grid electricity, and natural gas), and 19,187,733 MJ of renewable energy (i.e., renewable derived grid electricity and solar electricity). Total energy demand was 39,624,001 MJ. Direct freshwater consumption was 6,357,497 gallons. Waste production was 1,905,080 lb of mixed municipal solid waste (MSW).

Overall benchmarking of environmental indicators against similar post-processing revealed that TFI performed well, with all indicators being lower than the comparisons except MSW. Future comparisons would be improved by having disaggregated data for warehousing and post-processing for all inputs related to energy, GHG and water. This would result in much more insightful comparison data for each side of the operation.

To move towards improved environmental performance to meet established company targets, the project assessed the following options which have the potential to reduce emissions from the facility:

- Increasing energy productivity to reduce scope 1, 2 and 3 emissions and the energy footprint of the facility.
- Increasing the size of the solar installation to meet the renewable energy goal to reduce scope 2 emissions.
- Switching to refrigerants with lower global warming potential. Pending further detail regarding measured losses, this may have the potential to significantly reduce scope 1 emissions.

The following options were also assessed. These provided a minor opportunity to reduce impacts, or no opportunity depending on the strategy:

- Reducing waste to landfill to reduce scope 3 emissions and the waste footprint of the facility.
- Measuring and decreasing rendering to increase facility throughput and reduce scope 3 emissions.
- Using sustainable packaging to reduce scope 3 emissions.
- Redirecting material from rendering to compost. This strategy was found to slightly increase scope 3 emissions and was not recommended.

The following recommendations were made regarding improved measurement and assessment:

- Measuring loss rates (recharge) of refrigerants. This is currently not measured, and an estimate was used. Considering it was a large emission source, the level of uncertainty would be reduced by measuring this in the coming 12 months.

- Separately metering the electricity usage from warehouse and processing areas to accurately determine scope 1 and 2 emissions intensity for warehoused and processed products. This would allow more accurate recording of impacts for meat products that are post-processed and would allow greater insight into productivity measures that could improve efficiency, such as reduce warehouse storage time.
- Separate recording of storage times, product mass loss and packaging by product line.

Thomas Foods International have conducted a review of customer requirements for sustainability reporting and this was extended by the project team. This review found that goals exist for almost all suppliers covering reduction in GHG emissions. In most cases, this extends to reduction targets for scope 3 emissions (that is, emissions covering the full meat supply chain). Considering red meat is one of the biggest emission sources of retailers and food service companies, these reduction targets will inevitably be shifted down the supply chain as a market expectation. It should be expected that formal scope 3 reporting will be a feature in the near future as companies work to 'make good' on publicly stated goals.

In addition to GHG reporting, energy, packaging, waste and water are listed by most customers, and some specific targets exist for stand-out contributions to the processing and retail end of the supply chain. Of these, refrigerants and transport are notable. While targets exist for many environmental indicators, GHG, energy, packaging and waste are by-far the most ambitious and should be seen as the priority for processors, and for the whole supply chain.

The present study was designed as stage 1 of a three-stage project, with stage 2 and 3 covering review of strategy and consumer requirements, and potentially expansion of the study to assess impacts through primary processing and production. It was agreed with TFI that this stage 2 aspect has largely been done by TFI staff with assistance from the project team. The findings of this study can now consider stage 3, which focused on assessment of the supply chain.

Benefit for Industry

As part of this study, customer goals and targets were reviewed. This review found that GHGF emission reduction goals exist for almost all supplier types. In most cases, this extends to reduction targets for scope 3 emissions (that is, emissions covering the full meat supply chain). Considering red meat is one of the biggest emission sources of retailers and food service companies, these reduction targets will inevitably be shifted down the supply chain as a market expectation. It should be expected that formal scope 3 reporting will be a feature in the near future.

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TFI are pioneering the area of calculating and reporting of supply chain emissions to supermarket customers in the area of meat processing. Knowledge gained will help educate the broader industry in the face of increasing environmental sustainability demands to meet consumer expectations.

Useful resources

All Energy Pty Ltd 2021, *2020 Environmental Performance Review (EPR) for the Red Meat Processing (RMP) Industry*, Australian Meat Processor Corporation and Meat & Livestock Australia.

Asem-Hiablie, S, Battagliese, T, Stackhouse-Lawson, KR & Rotz, CA 2019, 'A life cycle assessment of the environmental impacts of a beef system in the USA', *The International Journal of Life Cycle Assessment*, vol. 24, no. 3, The International Journal of Life Cycle Assessment, pp. 441–455.

NCBA 2014, *Sustainability Executive summary*, National Cattlemen's Beef Association, viewed <https://www.beefboard.org/wp-content/uploads/2019/06/SustainabilityExecutiveSummary.pdf>.