

INDUSTRIAL TOOLS AND CALCULATORS

SUMMARY OF RESOURCES

TOOL NAME	SHORT DESCRIPTION
Savings Calculators	
MEASUR	Energy calculator: Calculates energy savings for lighting, pumps, fans, motors, compressed air, process heating, process cooling, steam, wastewater, combined heat and power (CHP)
INTEGRATION	Pinch analysis: Provides assessments and optimization of energy-saving projects
Payback – VFD Calculator	Motors: Estimates energy savings, returns on investment, and CO ₂ emission reductions for multiple motors
Single Motor Energy Calculator	Motors: Calculates energy efficiency and financial benefits of optimizing or replacing electric motors
Motor Efficiency Calculator	Motors: Calculates energy savings based on efficiency of different types of electric motor
Valve Controller Energy Saving Calculator	Valves: Estimates energy savings from optimizing or upgrading valve controllers
Industrial Systems	
Waste to Energy Calculator	Waste recovery: Estimates the energy generation potential from various types of waste
Xylem Interactive Tools	Motors, VFDS: Optimizes industrial process pumping systems
Prism Engineering Energy Calculators	Cost calculator: Quickly estimates boiler efficiency, ventilation system costs, as well as motor and pump costs
3E Plus	Efficient insulation: Calculates energy savings, cost savings, and greenhouse gas reductions resulting from insulation
Emissions Calculators	
Simplified GHG Emissions Calculator	GHG emissions: Estimates annual greenhouse gas emissions
Carbon Emissions Calculator	GHG emissions: Estimates CO ₂ emissions savings from implementing various energy-efficiency measures in buildings
Carbon Project Implementation Tracker Tool	GHG emissions: Helps organizations effectively monitor and manage their carbon reduction projects
Energy Management Tools	
Energy Performance Indicator Tool (EnPI)	Energy management: Measures and tracks the energy performance of industrial facilities
Energy Footprint Tool	Energy management: Tracks energy consumption and significant energy end uses
Electrification for Decarbonization	Energy management: Assesses the potential benefits and impacts of electrifying various processes and systems
Building Efficiency Targeting Tool For Energy Retrofits (BETTER)	Energy management: Identifies cost-saving energy efficiency measures using readily available data



SAVINGS CALCULATORS

MEASUR

MEASUR is a comprehensive tool developed by the U.S. Department of Energy (DOE) and Oak Ridge National Laboratory (ORNL), designed to help manufacturers identify, assess and quantify energy savings and decarbonization opportunities in their operations and energy support systems.

- The MEASUR tool provides over 70 standalone calculators for a wide range of industrial systems and equipment, including: lighting, pumps, fans, motors, compressed air, process heating, steam, wastewater, and combined heat and power (CHP).

LINK

<https://measur.ornl.gov/>

INTEGRATION

This advanced tool is designed for comprehensive assessments and optimizations of energy-saving projects in industrial settings. It allows users to determine the energy performance of industrial energy systems and identify waste heat levels by pinpointing areas where heat exchange is inefficient. The software can analyse changes in the operating conditions of energy-intensive equipment such as boilers, compressors, kilns and dryers. It also supports the evaluation of heat recovery projects focused on both individual energy-intensive equipment and broader heat exchanger networks, helping to enhance overall energy efficiency and reduce waste.

LINK

<https://natural-resources.canada.ca/maps-tools-and-publications/tools/modelling-tools/integration/24559>

TRAINING

<https://cietcanada.com/programs/hiip/>



SAVINGS CALCULATORS

PAYBACK – VFD CALCULATOR

This calculator estimates energy savings, returns on investment and CO₂ emission reductions related to the installation of variable frequency drives on motors.

LINK

https://ecatalog.weg.net/tec_cat/retornoinvestautomation.asp

SINGLE MOTOR ENERGY CALCULATOR

This tool evaluates the energy efficiency and financial benefits of optimizing or replacing electric motors, including energy savings estimates and payback period analysis.

LINK

https://ecatalog.weg.net/tec_cat/retornoinvestmotor_web.asp?cd_mercado=000U

MOTOR EFFICIENCY CALCULATOR

This tool assesses the efficiency of different types of electric motors, including high-efficiency motors and variable frequency drive (VFD) motors. It allows users to compare these options against standard models, estimate potential energy savings and evaluate the financial implications of switching to more efficient motor technologies.

LINK

<https://www.emotorsdirect.ca/motor-efficiency-calculator>

VALVE CONTROLLER ENERGY SAVING CALCULATOR

This calculator estimates energy savings from optimizing or upgrading valve controllers. It helps users assess the impacts of different technologies on system efficiency and provides a cost-benefit analysis for financial benefits.

LINK

<https://www.valmet.com/flowcontrol/valve-automation/valve-controller-energy-saving-calculator/>



INDUSTRIAL SYSTEMS

WASTE TO ENERGY CALCULATOR

The waste-to-energy calculator from ORNL evaluates the potential for generating energy from various waste materials to support waste management and sustainability efforts. Key features include:

- **Energy potential analysis:** estimates energy production from municipal, industrial and agricultural waste.
- **Waste types:** assesses energy content based on waste characteristics and conversion methods.
- **Comparative analysis:** compares the energy potential of different waste management strategies.
- **Environmental impact:** highlights environmental benefits, including reductions in greenhouse gas emissions and landfill use.

LINK

[WastetoEnergy Calculator](#)

XYLEM INTERACTIVE TOOLS

The Xylem suite of interactive tools and calculators helps users estimate potential energy savings by designing and optimizing industrial process systems. It is focused on identifying energy-efficiency improvements across various applications, including water and wastewater treatment, heating, cooling and pumping systems. The tool allows for customization by letting users input specific data about their systems and operations and then providing tailored recommendations and savings estimates. It also evaluates different system designs and operational changes to identify the most energy-efficient solutions.

LINK

<https://www.xylem.com/en-us/support/interactive-tools-calculators/>

PRISM ENGINEERING ENERGY CALCULATORS

Prism provides simple calculators to quickly estimate boiler efficiency, ventilation system costs as well as motor and pump costs. The calculators include:

- Condensing boiler
- Ventilation
- Conditioned air
- Motor
- Pump

LINK

<https://www.prismengineering.com/calculators/>

INDUSTRIAL SYSTEMS

3E PLUS

The 3E Plus Insulation Thickness Calculator, developed by the North American Insulation Manufacturers Association (NAIMA), is designed to help users determine the optimal insulation thickness for pipes and equipment. This tool calculates the energy savings, cost savings and greenhouse gas reductions resulting from insulation. The tool can help identify the most efficient insulation solutions to minimize energy loss, improve process efficiency and enhance safety.

LINK

<https://3eplus.org/calculations>

EMISSIONS CALCULATORS

SIMPLIFIED GHG EMISSIONS CALCULATOR

This calculator is designed for small businesses and organizations with low emissions to estimate their annual greenhouse gas emissions. The tool calculates both direct and indirect emissions based on input activity data, making it easy to inventory GHG emissions. The calculator is available as an Excel workbook using macros and the XLOOKUP function and requires users to enable macros for full functionality.

LINK

https://www.epa.gov/system/files/other-files/2022-09/calculator_tool.xlsm

CARBON EMISSIONS CALCULATOR

This calculator estimates the carbon dioxide emissions reductions from implementing various energy-efficiency measures in buildings. Users enter data about building characteristics and energy use to receive customized calculations of potential CO₂ reductions. This tool supports efforts to improve energy efficiency and reduce the carbon footprints of buildings.

LINK

<https://carboncalc.ornl.gov/>

CARBON PROJECT IMPLEMENTATION TRACKER TOOL

This tracker is designed to help organizations effectively monitor and manage their carbon reduction projects. This tool enables users to track the progress of various carbon reduction initiatives, measure their impact and ensure alignment with overall sustainability goals, by providing an overview of project timelines, milestones and outcomes.

LINK

[Carbon Project Implementation Tracker](#)



ENERGY MANAGEMENT TOOLS

ENERGY PERFORMANCE INDICATOR TOOL (EnPI)

The EnPI tool helps organizations measure and track the energy performance of their industrial facilities. It establishes normalized baseline energy consumption, accounting for production, weather and other variations, as well as tracks progress toward energy intensity improvements, cost savings and avoided CO₂ emissions. By using the EnPI tool, companies can begin to understand their energy use patterns and develop strategies to reduce energy consumption and greenhouse gas emissions.

LINK

<https://www.energy.gov/eere/iedo/articles/energy-performance-indicator-tool>

ENERGY FOOTPRINT TOOL

This tool helps manufacturing, commercial and institutional facilities track their energy consumption and significant energy end uses. It also helps facilities establish energy footprints and identify areas for improvement.

LINK

https://energyefficiency.ornl.gov/wp-content/uploads/2020/07/DOE_Energy_Footprint_Tool_v1.1.zip

ELECTRIFICATION FOR DECARBONIZATION

This tool helps users assess the potential benefits and impacts of electrifying various processes and systems. It helps to support the transition to electric power by evaluating the energy savings, cost reductions and emission reductions associated with electrification. It can also be used to support strategic planning to reduce carbon footprints and improve overall energy efficiency.

LINK

<https://electrification.ornl.gov/>

BUILDING EFFICIENCY TARGETING TOOL FOR ENERGY RETROFITS (BETTER)

BETTER is a software toolkit designed to help building operators identify cost-saving energy-efficiency measures using readily available data. Leveraging user data, BETTER can benchmark energy use, quantify potential reductions in energy, costs, and greenhouse gases and propose both technological and operational measures. While the web application is currently free for early adopters, the source code is also available on GitHub under an open-source licence allowing users to integrate BETTER's capabilities into their own software platforms.

LINK

<https://better.lbl.gov/>