Glossary of Terms

The following is a summary of selected terms and abbreviations used in the Strategic Development Team Report. In some cases, terms are defined in the body of the text and may not be repeated here.

Term	Definition
Air Pollutants	In addition to greenhouse gases, these include Sulphur dioxide (SO2), Nitrogen oxide (NOx), Hydrogen chloride (HCl), Hydrogen fluoride (HF), Carbon monoxide (CC), and Non-Methane Volatile Organic Compounds (NMVOC).
ASHRAE	The American Society of Heating, Refrigerating and Air-Conditioning Engineers
Base Case	Forecast of the 2010 to 2050 energy needs assuming no changes in efficiency and fuel mix.
Baseline	Estimation of the present energy use, greenhouse gas emissions, and the prevailing conditions affecting them.
Biomass	Vegetation such as wood, agricultural or animal waste, catering waste or landfill gas, etc. with the potential to be used as a fuel. Suitably separated municipal waste may fall into this category.
Btu	British thermal unit (BTU or Btu) is a unit of energy defined as the amount needed to heat one pound of water one-degree Fahrenheit. For the purposes of the CEP PWT Report, 1,000 Btus are labeled kBtu, while 1,000,000 Btus are labeled MM Btu.
Building Code	Legally required construction practices.
Building Standard	Voluntary construction practices, generally exceeding code Requirements.
Built Infrastructure	General term referring to all the residential and non-residential buildings in Holland
CAFÉ	Corporate Average Fuel Economy, defined as the sales weighted average fuel economy, expressed in miles per gallon (mpg), for a fleet of vehicles. This is a mandatory standard regulated by the EPA. The 2009 version includes greenhouse gas emissions per mile for the first time.
Carbon Dioxide	The most common form of greenhouse gas. Over 70% of man-made greenhouse gas emissions are from the use of fossil fuels (oil, gas, cola) and are in the form of Carbon-dioxide.
Cap and Trade	Regulatory approach to reduce greenhouse gas and other emissions. The Cap is the maximum permitted emissions. An emitter who emits less than the Cap can sell the difference to an emitter who is exceeding their cap. The price is set by the supply and demand needs in a free market.
Carbon Dioxide Equivalent	Where “e” is used to denote the term “equivalent”: Greenhouse effect of the other five greenhouse gases identified in the Kyoto Treaty expressed in equivalents of carbon dioxide. This unit of measure is used to allow the addition of or the comparison between gases that have different global warming potentials (GWPs). Since many greenhouse gases (GHGs) exist and their GWPs vary, the emissions are added in a common unit, CO_2e. To express GHG emissions in units of CO_2e, the quantity of a given GHG (expressed in units of mass) is multiplied by its GWP.
Carbon Neutral	Pertaining to or having achieved a state in which the net amount of carbon dioxide or other carbon compounds emitted into the atmosphere is reduced to zero because it is balanced by actions to reduce or offset these emissions.
Carbon Tax	Regulatory approach to reduce emission to reduce greenhouse gas emissions by taxing the carbon content of fossil fuels.

Term	Definition
Certified Emission Reduction	Generic term used to describe metric ton of greenhouse gas reduction or avoidance that has independently validated certification and can be traded in a recognized regulated market. Certified Emission Reductions come in many forms.
CHP	See “Cogeneration.”
City of Holland or City	Entire content including all buildings and entities inside the City of Holland boundaries.
city	Government agency and responsibilities only.
Clean and Renewable Energy	This phrase is used to indicate some combination of renewable energy and cogeneration (CHP) energy sources.
CO_2	See “Carbon dioxide”
CO_2e	See “Carbon dioxide equivalent”
Cogeneration	Generating electricity in such a way that most of the heat produced is usefully used. A common definition is that an average minimum overall fuel efficiency of 70% is expected. Peak efficiency would typically exceed 90%. Also known as “CHP.”
Combined Cycle	A type of power generation system that utilizes combustion turbines paired with steam turbines in such a way where the heat that remains after the combustion turbine performs its work provides enough steam producing capacity to enable 50% more power from the steam turbine.
Combined Heat and Power	See “Cogeneration.”
Commercial Buildings	Non-residential buildings; often owned or operated by for-profit entities.
Cooling Degree Days	A measure of how hot a location was over a period, relative to a base temperature. In the CEP PWT Report the base temperature is 65°F and the period is one year. If the daily average temperature exceeds the base temperature, the number of cooling degree-days for that day is the difference between the two temperatures. However, if the daily average is equal to or less than the base temperature, the number of cooling degree-days for that day is zero.
Day lighting	Designing buildings to maximize the use of natural daylight to reduce the need for electricity.
District Cooling	Cooling services delivered via district energy systems.
District Energy	Networks that deliver heating or cooling to energy consumers carried through the medium of chilled or hot water, or (in older systems) steam. Heating and cooling are transferred to the home or buildings via a heat exchanger.
District Heating	Heat services delivered via district energy systems.
Electrical Conversion Losses	The difference between the energy values of the fuel used to make electricity and the energy value of the electricity itself.
Electrical Emission Factor	The quantity of an emitted pollutant (such as Carbon Dioxide) expressed per unit of electrical output of the power generation source. An example would be pounds of carbon dioxide per megawatt-hour of electricity.

Term	Definition
Energy Performance Label	This would be an easily recognizable benchmark that energy auditors, retrofitters, lenders, realtors, and consumers can use to compare home energy performance and identify the most energy efficient residential and non-residential buildings. It would show how much energy a home or building used per utility bills, as opposed to energy modeling which attempts to predict how much energy a home or building would use and would compare that structure to similar structures.
ENERGY STAR®	Joint U.S. Environmental Protection Agency and U.S. Department of Energy programs http://www.energystar.gov/ supporting energy efficiency as a cost-effective way to reduce greenhouse gas emissions in home, buildings, industry, and equipment.
EPL	See "Energy Performance Label"
EU	European Union
EV	Electric Vehicle
EWR	Energy Waste Reduction. A program that incentives, usually through rebates, customer behavior in the selection of energy consuming products to choose those with higher energy efficiency.
Fossil Fuels	Combustible material obtained from below ground and formed during a geological event. For purposes of the CEP PWT Report, examples of such fuels include coal, oil, and natural gas.
GDP	See "Gross Domestic Product"
Geothermal systems (low temperature)	Systems that use the relatively constant temperature of the ground starting about 6 to 10 feet below ground to cool buildings in summer and heat them in winter.
GHG	See "Greenhouse Gases"
Global Warming Potential	A relative measure of the warming effect that the emission of a GHG might have on the Earth's atmosphere. It is calculated as the ratio of the time-integrated radiative forcing (i.e., the amount of heat-trapping potential) (measured in units of power (watts) per unit of area (square meters) that would result from the emission of 1 kg of a given GHG to that from the emission of 1 kg of CO_2. For example, the GWP for nitrous oxide (N_2O) is 310, which means that 1 kg of N_2O emissions is equivalent to 310 kg of CO_2 emissions.
g/m	Grams of CO_2 per vehicle mile - term used to describe GHG emissions as they apply to transportation.
Green Energy	Energy derived from conservation, renewable sources of energy and clean distributed energy. What energy forms are included varies depending on local jurisdictions and practices.
Greenhouse Gases	A greenhouse gas absorbs and radiates heat in the lower atmosphere that otherwise would be lost in space. The main greenhouse gases are carbon dioxide (CO_2), methane (CH_4), chlorofluorocarbons (CFCs) and nitrous oxide (N_20), sulphur hexafluoride (SF_6), hydrofluorocarbons (HFC) and per fluorinated carbons (PFC). The most abundant greenhouse gas is carbon dioxide (CO_2).
GHG Monetization	Processes to convert tradable energy and environmental benefits into cash or cash equivalents.
Gross Domestic Product	The total value of goods and services produced by a country during a given time, most commonly a year.

Term	Definition
GWP	See “Global Warming Potential”
HBPW	Holland Board of Public Works – City owned utility currently responsible for electricity distribution, water services, sewage, and wastewater services to the City of Holland. HBPW also serves some customers in surrounding communities.
Heating Degree Days	A measure of how cold a location was over a period, relative to a base temperature. CEP PWT Report, the base temperature is 65°F and the period is one year. If the daily average temperature is below the base temperature, the number of heating degree-days for that day is the difference between the two temperatures.
Hydrogen Fuel	An alternative fuel source that when combusted yields heat and water vapor. Essentially, it is a zero-carbon fuel source. Hydrogen must be separated from other compounds, which requires energy.
IECC	International Energy Conservation Code - a model energy building code produced by the International Code Council (ICC). The code contains minimum energy efficiency provisions for residential and commercial buildings, offering both prescriptive- and performance-based approaches. The code also contains building envelope requirements for thermal performance and air leakage. Primarily influences US and Latin American markets.
IEMP	Integrated Energy Master Plan – A comprehensive plan defining the energy efficiency of construction, energy distribution and energy supply to achieve agreed economic, environmental, and other goals. Typically, an IEMP would cover at least 15 years into the future and would apply to large developments, campuses, or neighborhoods.
Insolation	The amount of solar energy received on a surface over a period. It is usually expressed in units of kilowatts-hours per square meter (kWh/m^2), "peak sun hours", megajoules per square meter (MJ/m^2) or Langleys (L), for the given period such as a day or hour. $1kWh/m^2$ = 1 peak hour = 3.6 MJ/m^2 = 0.00116 L
Integrated Resource Plan	A roadmap to meet long-term forecasted electric energy demand using both supply and demand side resources, constrained to identified criteria, to enable reliable service to customers in the most cost-effective way.
Institutional Buildings	Nonresidential buildings generally owned by public administration, education, public or private healthcare facilities and other not-for-profit entities.
	Integrated Resource Plan: A roadmap to meet long-term forecasted electric energy demand using both supply and demand side resources, constrained to identified criteria, to enable reliable service to customers in the most cost-effective way.
KBtu	See “Btu”
Kilowatt-hour	A unit of electrical energy universally used as the basic billing unit and equals the use of one thousand watts of electrical energy in one hour. One kWh is about 3,412 Btu.
Kilowatt-hour Equivalent	A unit of energy from any source equivalent to one kilowatt-hour of electricity. Used to get a standard measurement for comparison of different forms of energy.
KWh	See “Kilowatt-hour”
KWhe	See “Kilowatt-hour equivalent”

Term	Definition
Kyoto Treaty	International Treaty sponsored by the United Nations aimed at reducing man-made greenhouse gases through reduced use of fossil fuels and reduced impact forestry and agriculture. Signed in 1997 and ratified in 2005 by most industrialized countries accepting mandatory targets; and by many other countries accepting mandatory reporting and voluntary goals.
Leadership in Energy and Environmental Design	A voluntary system for rating existing and new residential and non-residential buildings and neighborhoods based on their overall environmental performance including energy and water use. Developed by US Green Buildings Council, a non-profit group.
LEED	See "Leadership in Energy and Environmental Design"
Megawatt-hour	A unit of electrical energy equals the use of one million watts of electrical energy in one hour.
Megawatt-hour-equivalent	A unit of energy from any source equivalent to one megawatt-hour of electricity. Used to get a standard measurement for comparison of different forms of energy.
Metric Ton	Unit of weight equal to 1,000 kilograms. Often used in the CEP Project Work Team Report as a measure of greenhouse gas emissions. 1 mt = 1.102 US ton (or short ton).
MISO	The Midcontinent Independent System Operator. An entity in located in Carmel, Indiana, which administers high voltage transmission service tariffs throughout the central United States, including Michigan. MISO also operates electric energy and residual capacity markets as a bid/offer clearinghouse between generators and loads.
MM Btu	See "Btu"
Mt	See "Metric Ton"
Municipal Energy Company	While individual buildings that are customers in a district energy network are owned by property owners and developers, a Municipal Energy Company (MEC) is an organization that operates and maintains the district energy network, i.e., the horizontal infrastructure of district energy piping and equipment. The MEC can also wholly or partially own the district energy network.
MWh	See "Megawatt-hour"
MWhe	See "Megawatt-hour equivalent"
NGOs	Non-governmental organizations
NREL	National Renewable Energy Laboratory, part of U.S. DOE
Net-Zero Emissions	Offsetting emissions by implementing atmospheric removal techniques.
OECD	Organization for Economic Cooperation and Development
Per Capita	For each person in the registered population of the City; generally referred to as a resident.
PPA	Power purchase agreement. A bilateral transaction for electricity supply.
PV	See "Solar Photovoltaic Systems"
Reciprocating Engine	A type of power generation resource that drives a piston within a cylinder through the expansion of gases, converting the linear motion of the piston to rotational motion of a connected shaft, which in turn drives a generator.

Term	Definition
Renewable Energy	Energy generated from sources other than fossil fuels, most commonly sun, wind, water and various animal and plant derived fuels. These create the least greenhouse gases in operation.
RECS	A renewable energy certificate, or REC, is a market-based instrument that represents the property rights to the environmental, social and other non-power attributes of renewable electricity generation. RECs are issued when one megawatt-hour (MWh) of electricity is generated and delivered to the electricity grid from a renewable energy resource. The certificates are sometimes referred to as credits.
RPS	Renewable Portfolio Standard
Scale Projects	Developments with the size and timing such that new guidelines in line with the CEP can be applied within relatively large, but contained boundaries. These are projects large enough to capture the combined value of efficient use, efficient distribution, and clean and renewable energy, but are bounded such that benefits can be clearly identified and risks fully understood. They can range from entire mixed-use neighborhoods to single large commercial or institutional developments. Over time, multiple Scale Projects blend.
Simple Cycle	Unlike a combined cycle, which links both combustion turbine and steam turbine technology, simple cycle refers to a system that utilizes only combustion turbine technology.
Smart Growth	Approach to developing areas of cities to use minimum resources, to maximize social interactions with a balanced mix of demographics, usually associated with creating mixed-use, walk able neighborhoods, often with local distributed sources of energy.
Smart Meters	Energy meters (heat/electricity/cooling/gas) capable of gathering energy use patterns, applying different tariffs depending on time of day and use level, and capable of being integrated into wider information and control systems.
Solar Photovoltaic Systems	Systems that directly convert sunlight into electricity either for use locally or for delivery to the wider grid.
Sustainability	Meeting the needs of the present generation without compromising the ability of future generations to meet their own needs.
TOD	See “Transit Oriented Design”
Transit Oriented Design	Land development that considers transportation choices as a means of reducing oil and other energy use. Typically, it would combine public transit with walk able, mixed-use communities, and approaches to minimize the impact of individual vehicles and commuting.
UNFCC	United Nations Framework Convention on Climate Change
Vehicle Miles Traveled	The distance traveled by vehicles on the road.
VMT	See “Vehicle Miles Traveled”