

# Turtle Mountain Band of Chippewa Indians - TMBCI **10Y** Energy, Environmental and Economic Development Platform



DOE Office of Indian Energy

Tribal Leader Forum Series

Indian Pueblo Cultural Center – Albuquerque, NM

July 27, 2015

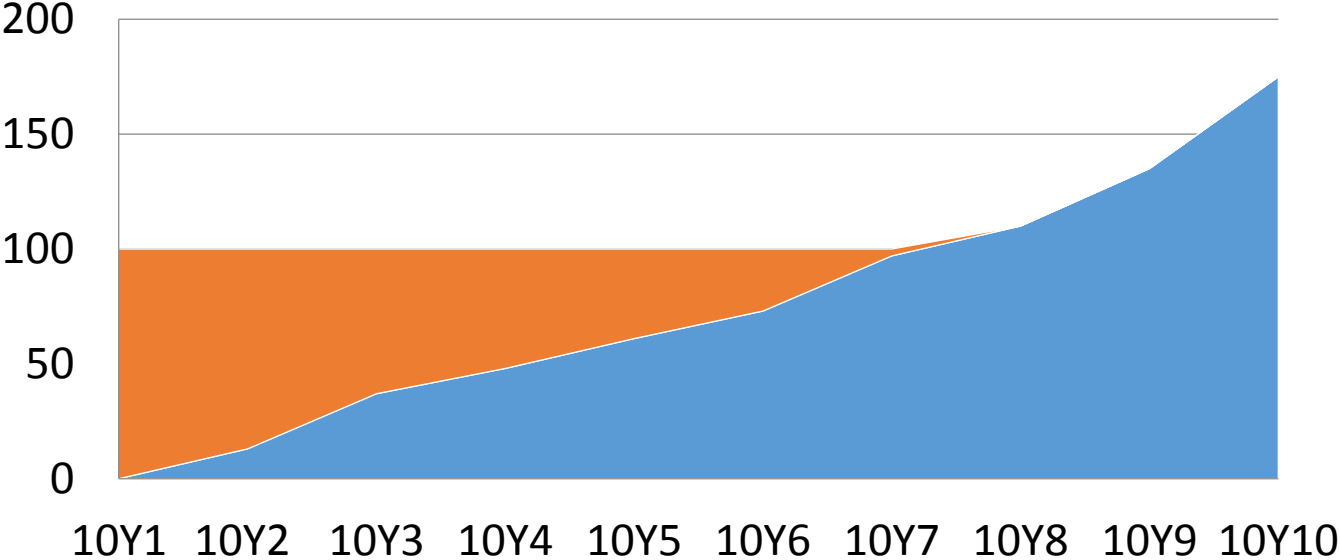
# 10Y Governance, Financial and Environmental Impacts

TMBCI Current Annual Energy Spend: **\$6.5 Million**  
**est.**

Daily Demand:  
**18MW est.**

## 10Y Growth Projection

- Non-tribal Utility Hydrocarbons
- TMBCI Efficiency and Renewables





# TMBCI Energy, Environmental and Economic Development Platform

# 10Y Phase 1.1 Creation of a Suite of Energy Companies

- Section 17 parent company through the BIA
- Project based LLCs
- Distributed and utility scale wind, solar, storage and microgrids
- Design, manufacture and construction of a Chippewa net zero housing prototype using TMBCI contractors, skilled workers and laborers
- Joint venture with La Fabbrica del Sole and other tribal partners on design, manufacture, sales, installation and maintenance for onsite renewable energy systems



# 10Y Phase 1.2 Creation of a Tribally Owned Utility

## Turtle Mountain Power Authority

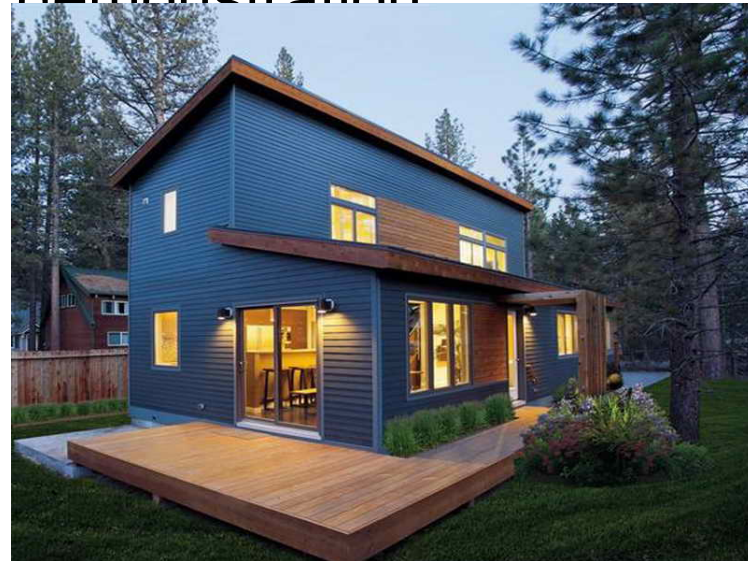
- Relationship building with the 3 non-tribal hydrocarbon based utilities; TMBCI sovereignty over its energy resources and power supply affirmed in North Central Power Coop, Inc. v. ND Public Service Commission, Otter Tail Power Company and the TMBCI, 2013 ND 158
- Unified utility software system
- Demand side management
- WAPA and LIHEAP credit audit
- Continued work on the Rugby to Glenboro 75MW Interconnection
- Homeowner and renter outreach through [www.chippewaenergy.com](http://www.chippewaenergy.com)





# 10Y Phase 1.3 Proof of Concept Residential Projects for the Chippewa Climate Zone and Ecoregion

- Integrated with TMBCI housing authorities
- Solar gardens, small scale wind and storage for operational efficiencies, cost sharing and savings
- Residential energy management, efficiency and generation technologies and applications - smart thermostats/meters combined with solar, small scale wind and energy storage can be installed very quickly as demonstration projects for existing housing stock







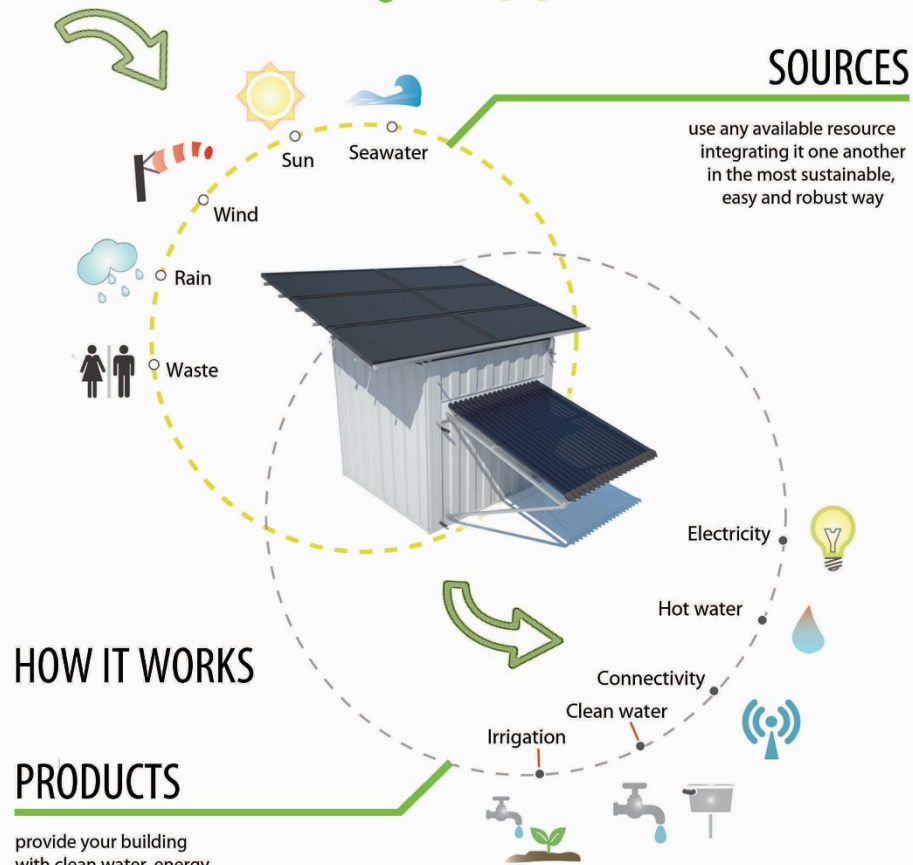
Google earth

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1000 ft





**HOW IT WORKS**

**PRODUCTS**

provide your building with clean water, energy and heat for free at zero impact

**BASIC FUNCTIONS**

- CLEAN WATER**

Source: rain, other water sources  
Device: storage, 10-60micron filtration and UltraViolet treatment  
Coverage: from 2 to 20 persons
- ELECTRICITY**

Source: sun, wind  
Device: photovoltaic min 2 kwp  
wind turbine min 500W  
Coverage: from 3000 kwh/y up to 30.000 kwh/y
- HOT WATER**

Source: sun, wind  
Device: stainless steel solar geyser  
Coverage: from 2 to 6 person
- DEPURATION**

Source: phytoremediation, sea water, contaminated water  
Device: pasteurization/distillation, microfiltration, reverse osmosis  
Coverage: from 10 to 10.000 liters/day
- CONNECTIVITY**

Source: satellite, GPRS/UMTS, 3G-4G  
Device: specific hardware, wifi, security webcam, remote monitoring system  
Coverage: global

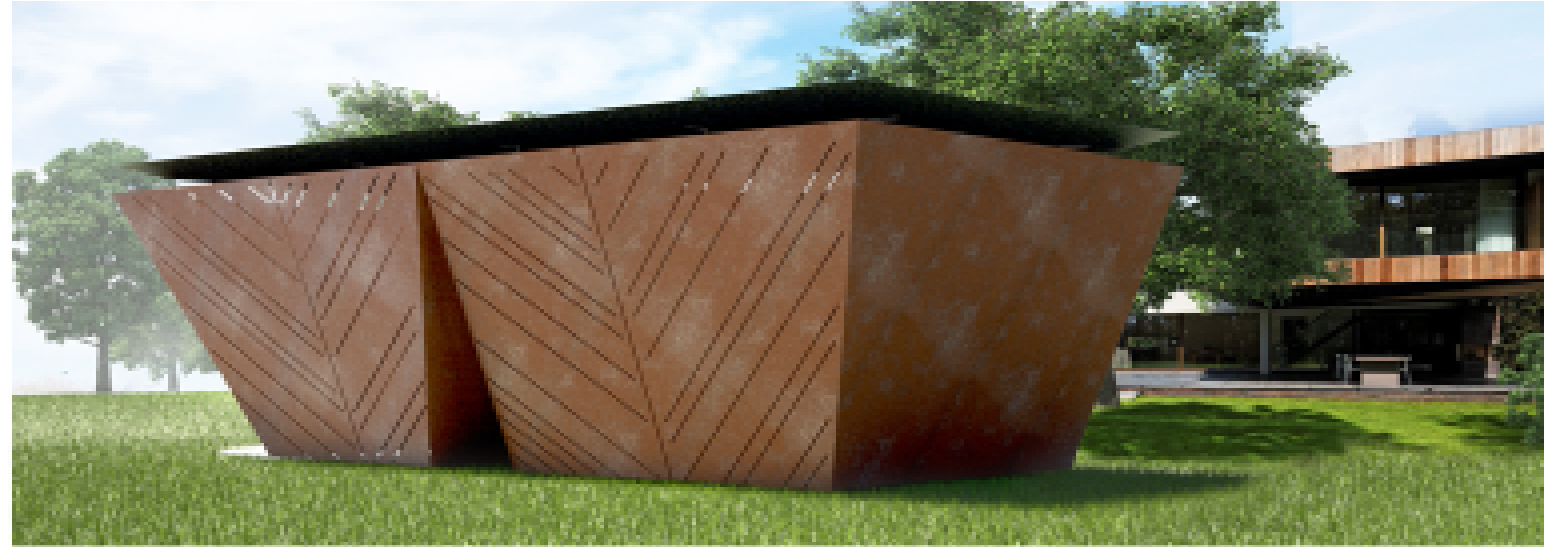
# Adaptive Energy Systems

Configurable for existing housing stock in the TMBCI climate zone and ecoregion

Customized design, manufacture, installation, maintenance, warranty and decommissioning for North American tribes



# Neighborhood and Community Scale Systems



Modules: 2

Fully customizable and scalable, demand response based on seasonal time of use consumption patterns with real time residential interface applications and programs

Systems output monitoring with wind/solar/storage forecasting data aggregated by the TMPA

## **10Y Phase 1.4 Turtle Mountain Manufacturing Center Energy and Efficiency Upgrade**

Energy Service Performance Contracts or ESPCs through the National Association of Energy Service Companies which are suitable for TMBCI projects because they provide the following advantages:

- Energy audit
- Financing
- Engineering + construction + commissioning
- Operations & Maintenance (O&M)
- Long term Measurement & Verification (M&V)



Buildings Research



# 10Y Phase 1.5 Development of 75MW of Wind on the Rugby to Glenboro 230 kV Line

- Reinstalled MET tower to acquire updated wind resource data
- Believed to have 50% site control, a critical milestone for the Go/No Go decision making sequence
- Maintaining movement on this project to position for the anticipated 2017 renewal of the Production Tax Credit (PTC)
- Project will be managed and regulated by the Turtle Mountain Power Authority

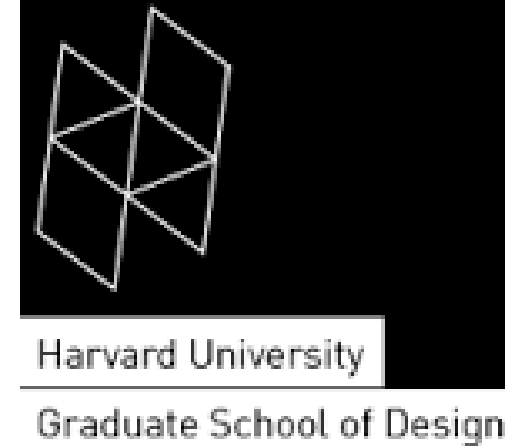


Midcontinent Independent  
System Operator



# 10Y Phase 1.6 Expansion of Collaborative Academic Partnerships for the TMCC

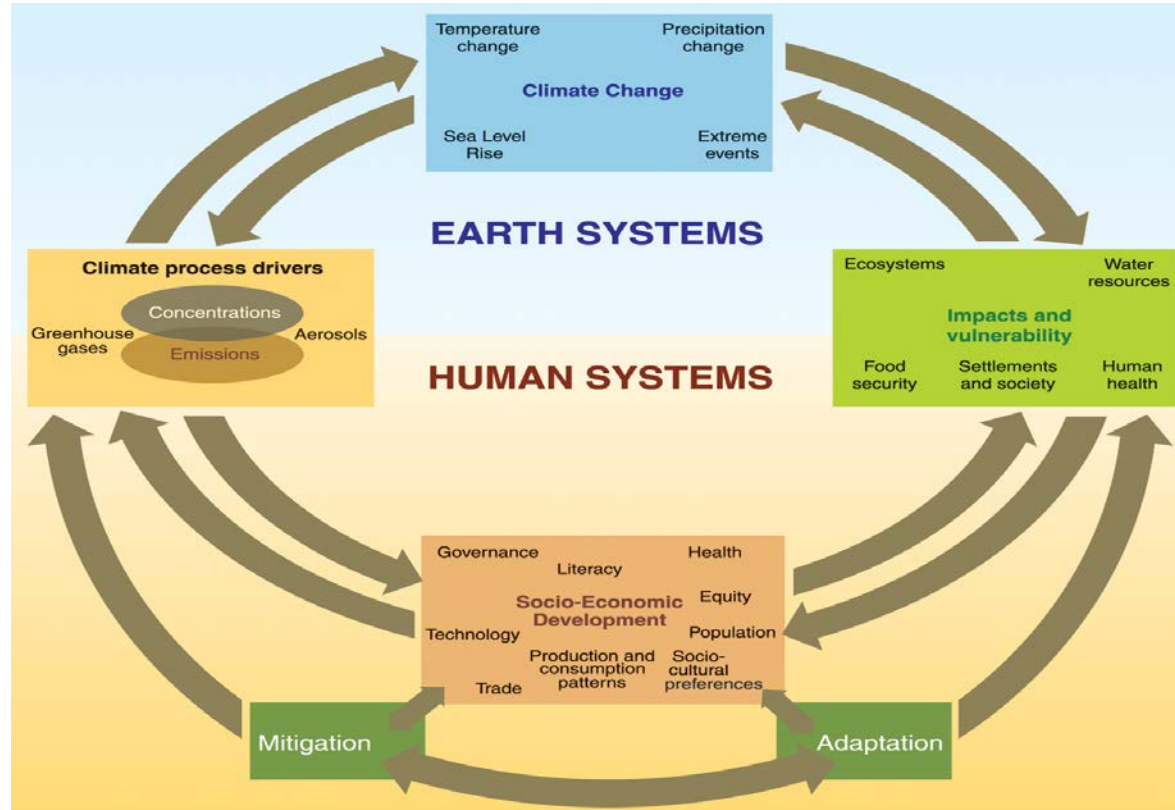
A faculty and student team from the Energy, Environments & Design Lab at the Harvard Graduate School of Design has begun research and design work on a native housing prototype with building integrated energy and water technologies using International Living Future Institute guidelines and standards



BSC National Energy Center of Excellence

In support of the technologies and applications of **10Y**, the Turtle Mountain Community College (TMCC) and Bismarck State College (BSC) have expanded their MoU to include TMCC certificate and 2 year degree programs

TMBCI prosperity through self-determined, sustainable economic development that:

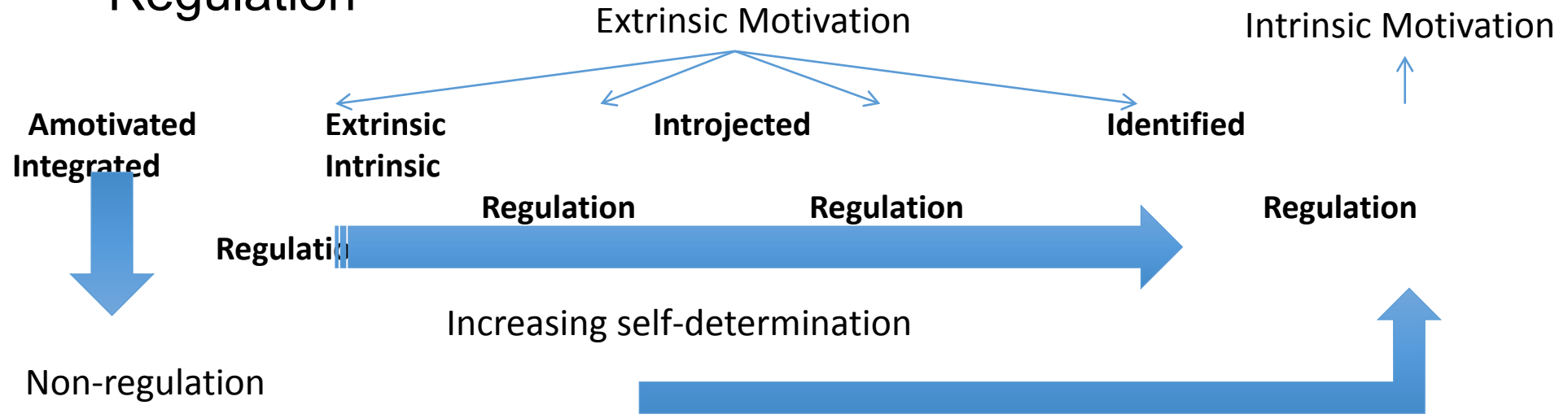


Source: Intergovernmental Panel on Climate Change, IPCC

Reintegrates earth and human systems through investments in renewable energy, water and food technologies that produce decadal returns and revenue streams

# The Self-Determination Spectrum

## Degrees of Self-Determination (SDT) in Behavioral Regulation



**Autonomy: volitional engagement in high quality forms of motivation**

**Competence: enhanced performance, persistence and creativity**

**Relatedness: increased sense of connectedness and collectivism**



# **10Y: Inclusive decision-making opportunities for low-income persons and those traditionally excluded from the processes of energy resource autonomy.**

**10Y** will reverse the historic trend of marginal participation in the energy decision-making process of the Tribe by creating organization(s) that can participate as peers among energy industry companies and utilities.

The Turtle Mountain Power Authority will reduce energy costs to Tribal members and organizations and exert sovereignty over its energy resources and infrastructure. Tribal renewable energy revenues will be generated by re-investing funds that currently flow to the three utility companies that serve the TMBCI.

