

# Microgrid Case Study

Colusa Indian Community  
Presented by Ken Ahmann



# Summary of Colusa Indian Community

Today, the Colusa Indian Community consists of 45 members of the Cachil Dehe Band of Wintun Indians and a total of 155 residents. The Tribe resides in the heart of Northern California's agricultural land on a 290-acre reservation, along the bountiful Sacramento River. The Tribe also has 16,000 acres of farmland.

The Colusa Indian Community owns and operates the Colusa Casino Resort, which is powered, heated, and cooled by the Tribal Utility Authority's tri-generation power plant. The TUA's 7.1MW micro-grid has had zero power interruptions in nearly 12 years.





# Colusa Casino Resort

Four miles north of Colusa, California on Highway 45

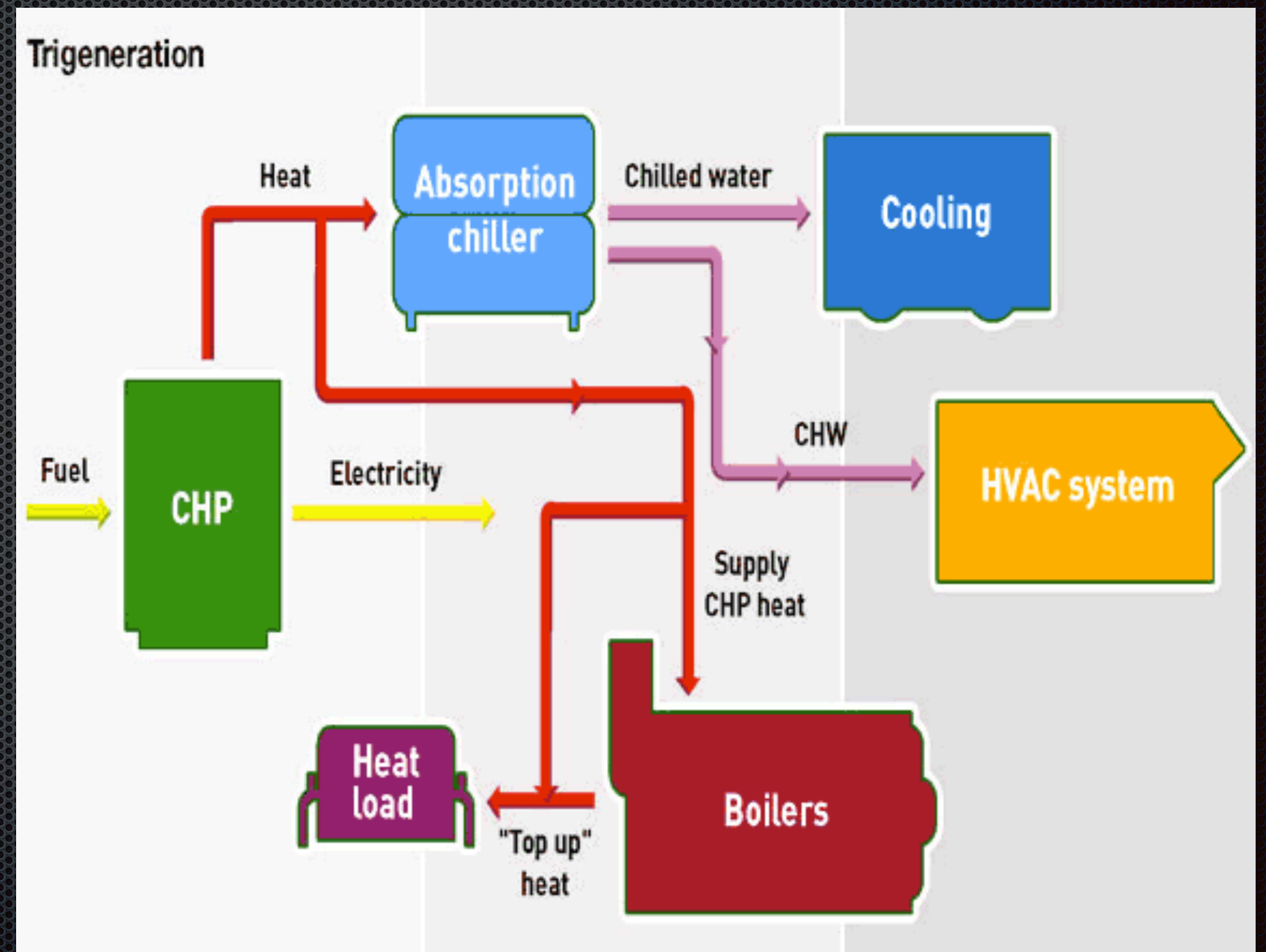
# History of CIC-Tribal Utility Authority

- Electrical Department created in 2003
- Tri-Gen commissioned in 2005
- TUA created in 2021 to unify resources and leadership of both departments
- Team includes director, managers, leads, technicians, operators, journeyman electricians, welders, pipe fitters, fabricators, and apprentices



# Co-Gen vs. Tri-Gen?

- Ideal base load power supply for micro-grids that also have large heating/cooling loads
- Cogeneration = production of electricity and usable heat from a single source of energy (natural gas, hydrogen, biogas, etc.)
- Tri-Generation produces power, heating, and cooling, replacing boilers and electric chillers
- Traditional power without any heat capture = 40% efficiency
- Co-Gen power = 75% efficiency
- Tri-Gen power = 90%+ efficiency



# Colusa - 2005

- Resort expanded and hotel was built
- Reservation experienced 50+ power outages per year from local utility
- Tri-Gen was built to power the resort and Tribal administration campus
- Originally consisted of 4MW of Jenbacher gas engines and two Thermax absorption chillers



# 2012

- 4MW battery UPS installed
- 4MW backup diesels installed
- Micro-grid has experienced zero power outages since this integration



# 2014

- DOE grant funded solar PV project completed
- 500kW solar canopy installed
- 100kW rooftop solar installed





# 2015

- Tri-Gen control system upgraded
- Absorption chiller expansion and replacement project began
- 300kW load bank added to system



# 2018

- Original 4 Jenbacher gas engines replaced at 80,000 operating hours
- Two additional Jenbachers added for total gas engine capacity of 6MW
- The new engines are 100% hydrogen ready



# 2019

- DOE grant funded solar project completed
- Four additional solar canopies installed, bringing total PV capacity up to 1.1MW



# 2020

- DOE grant funded micro-grid expansion project
- TUA replaced PG&E across entire reservation, including member housing, all Tribal businesses, water treatment plants, and more



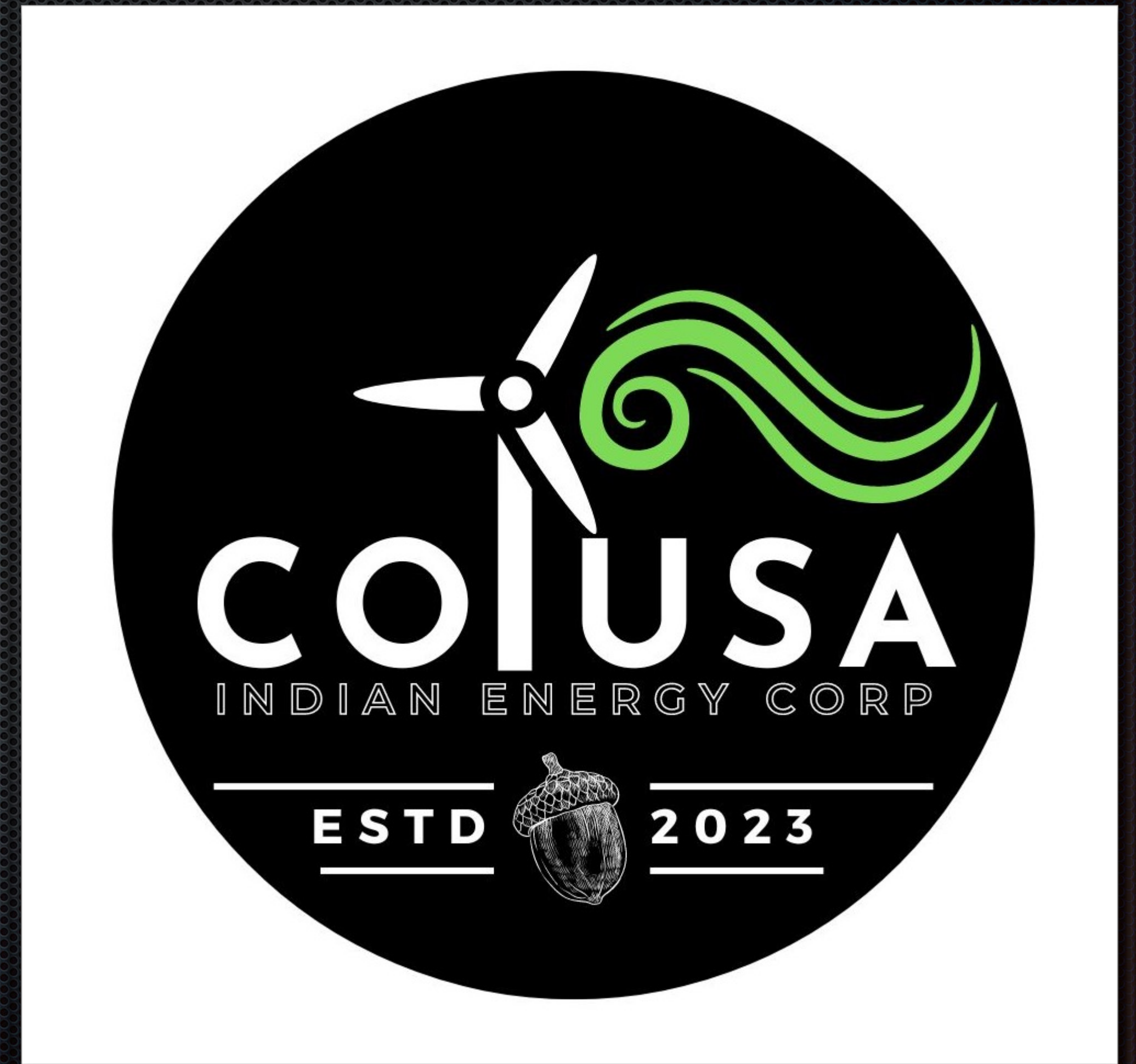
# 2023

- Absorption chiller expansion project complete
- UPS expansion project began
- 2MW BESS install began
- Colusa Indian Energy Corp formed



# Colusa Indian Energy's Mission

- Export our decades of micro-grid expertise to all Tribes that want it
- Promote Tribal energy sovereignty by assisting Tribes with their own TUA creation and management
- Act as a firewall between Tribes and non-Tribal entities in the energy infrastructure space across Indian Country

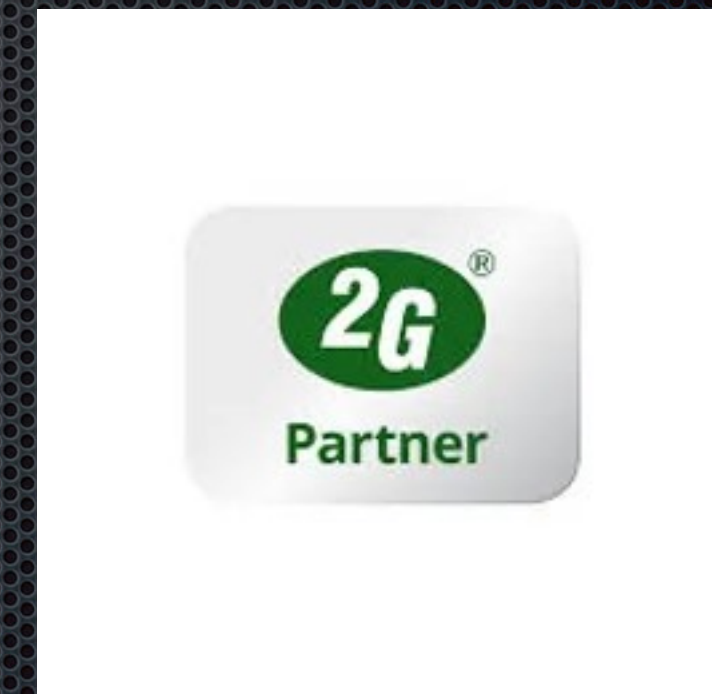


# Colusa Indian Energy's Services

- Grant funding identification and application technical assistance
- Micro-grid engineering, construction, operations, and maintenance
- TUA formation assistance
- Building an Alliance of Tribes who can depend on each other for resources in energy infrastructure, including technical help, training, funding, gas procurement, etc.

# Colusa Indian Energy's Partnerships

- Distributor level pricing on equipment and parts
- Guaranteed top level factory training access





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