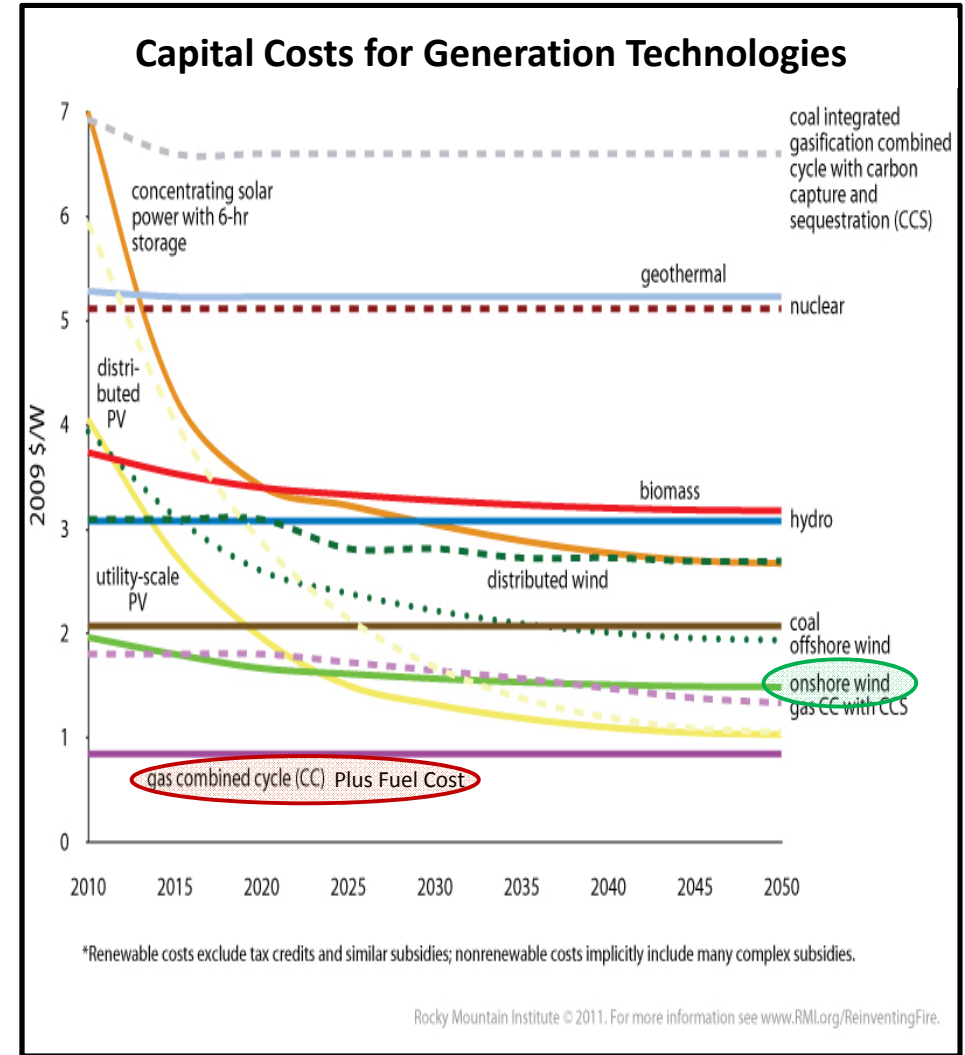
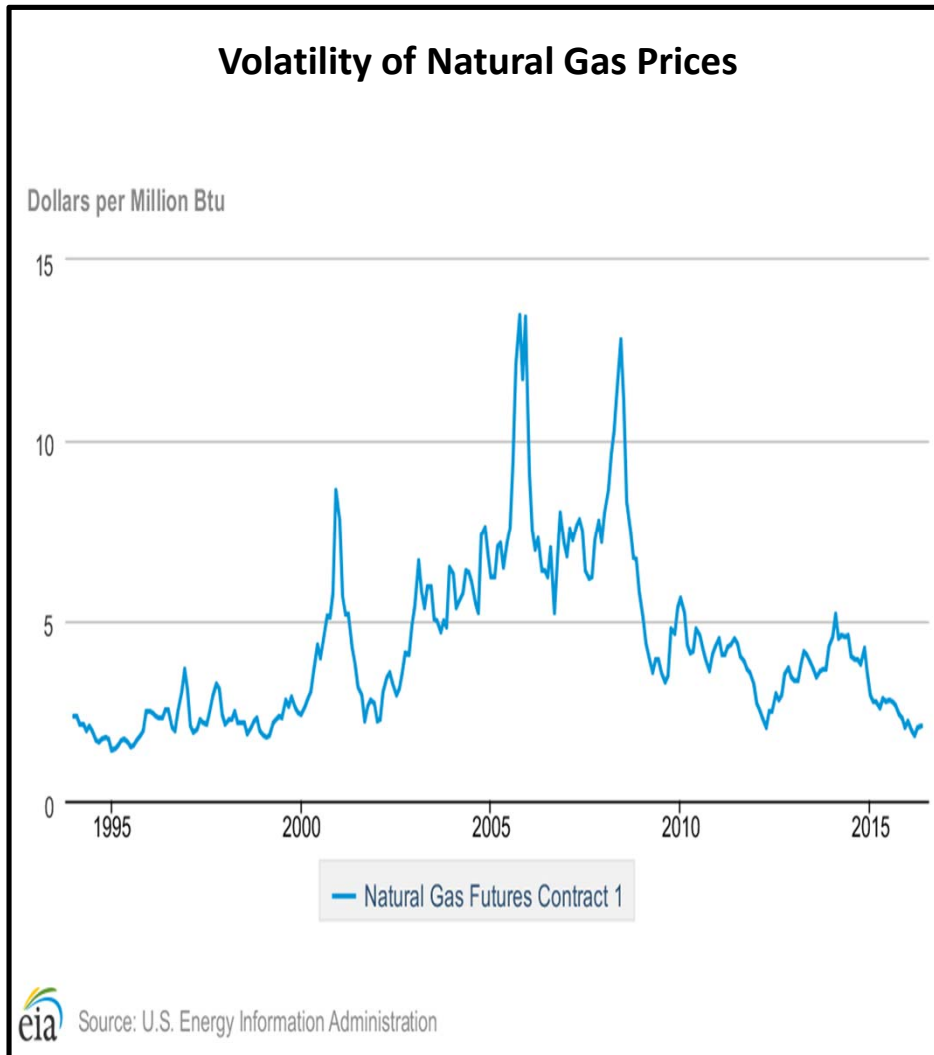


# MADA Energy Processing with Storage: Making Renewable Energy Reliable and Dispatchable

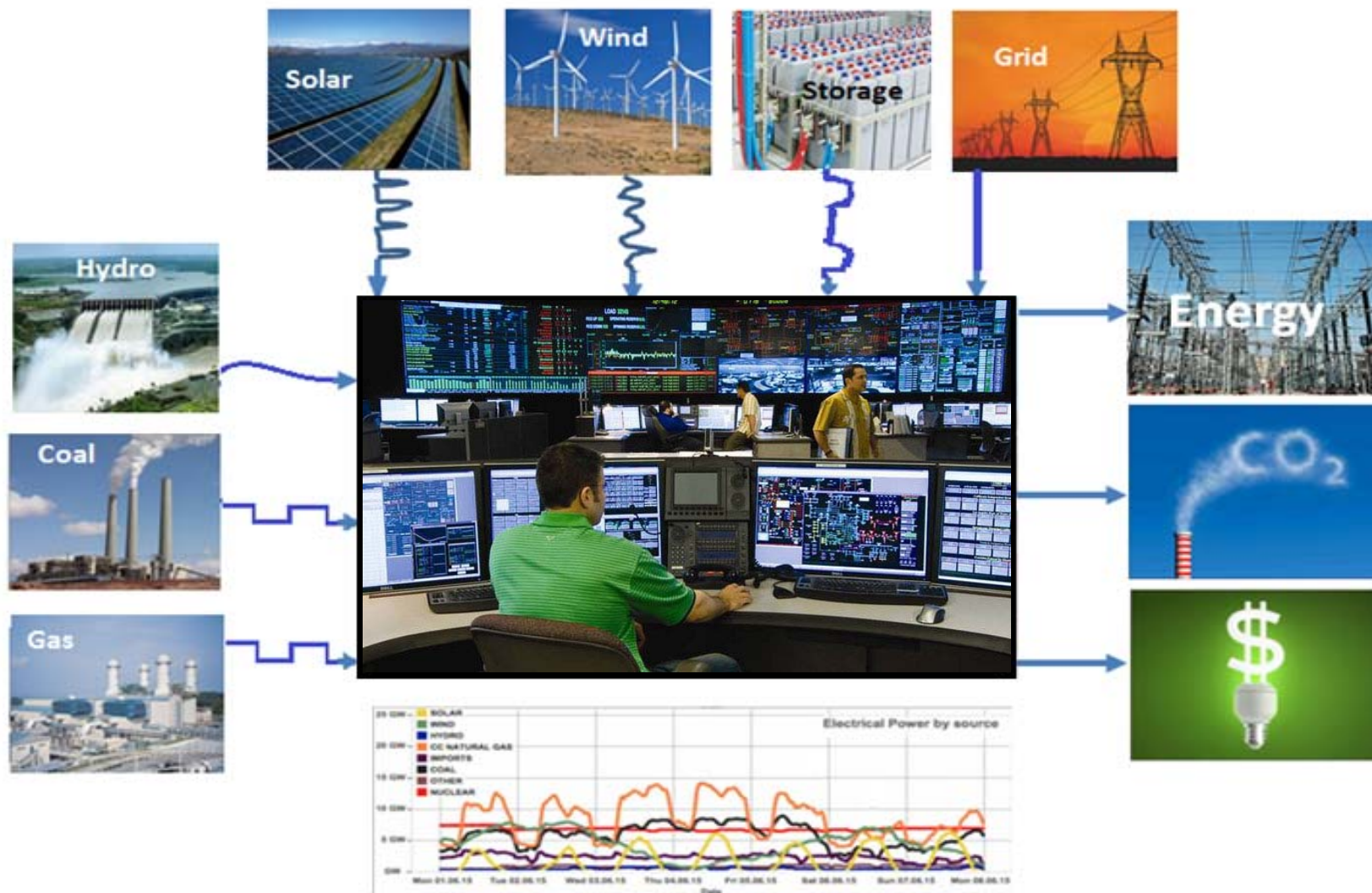
# MADA 's Mission and Vision

- MADA Energie, a technology company, and MADA Power, a development company, were founded by Arnold Goldman a successful visionary with renowned achievements in solar energy, energy storage and word processing.
- MADA Power will develop, own, and manage energy projects in the U.S. utilizing proprietary Energy Processing and thermal energy storage technologies developed and supplied by its affiliate, MADA Energie.
- MADA believes that cost effective energy processing with storage is the key to transforming the grid from a fossil to a renewable resource base.
- MADA's wants to facilitate a generational leap from a fossil to a largely renewable resource-based grid by pairing renewables with storage and energy processing (a control technology) backed up by legacy fossil assets.
- MADA's view is that new generation decisions favor renewable energy due to falling capital costs vs. gas with its high price volatility.

# Gas Prices Volatile, Renewable Costs Declining



# The Challenge: Integrate Intermittent Renewable Power with Reliable Fossil Power



# MADA's Replacement Approach

MADA's alternative to a 600MW CCGT is ~1500+ MW of wind & solar combined with a ~300MW Liquid Air Energy Storage system (LAES) and a MADA energy processor (control technology) that combines primarily direct wind with stored wind using coal or gas as back-up for reliability.

This will provide a hybrid, dispatchable energy product composed of more than 80% wind & solar + storage, less than 20% coal or gas and utilizes the existing 600MW of transmission with much higher capacity factor than for wind alone.



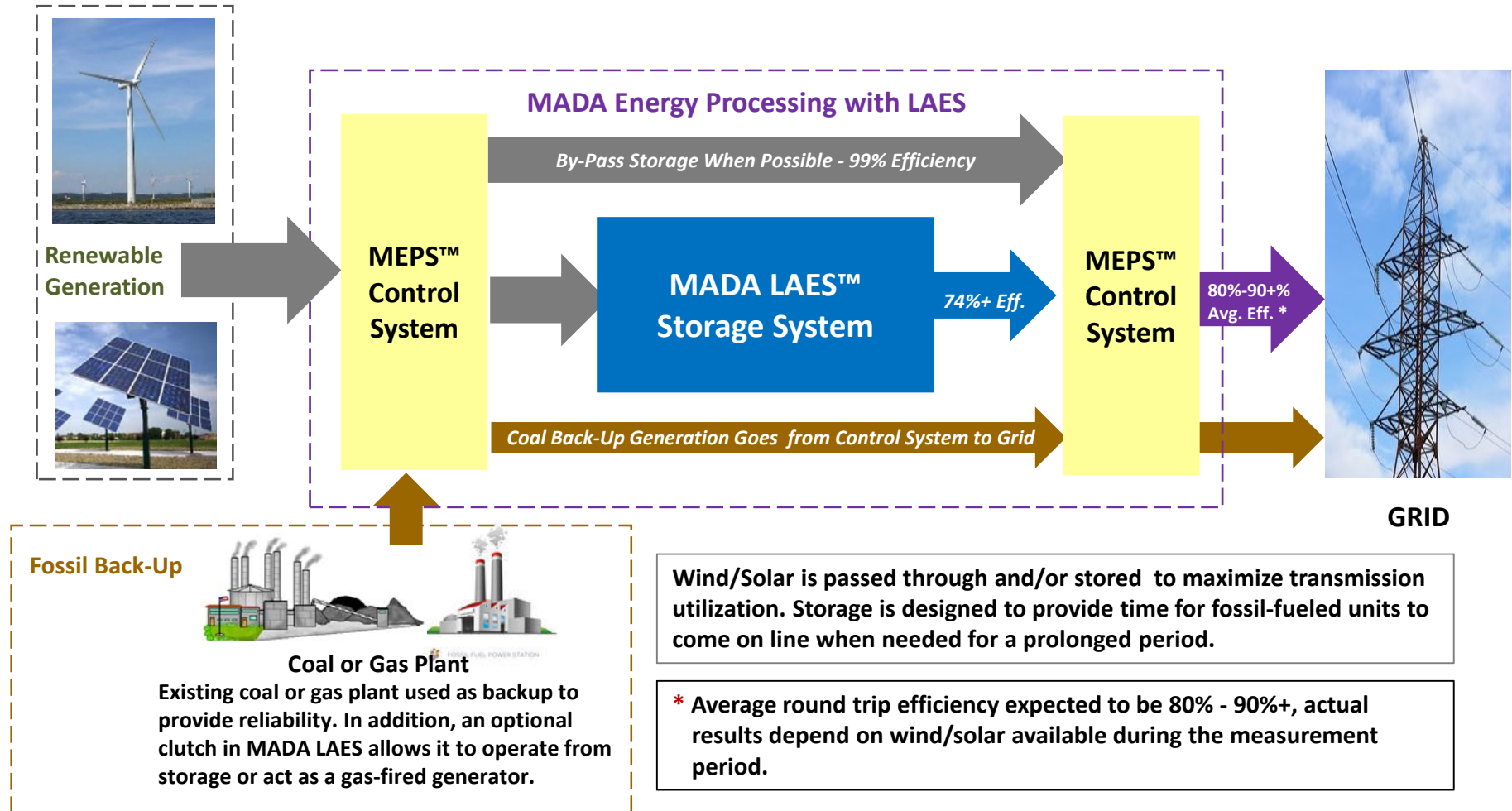
Existing Colstrip units can facilitate the transition from a fossil to a renewable resource base and eliminate the need for some new natural gas assets.

# What is Purple Power?

- **Brown Power** is power generated from a plant fueled by fossil fuels; it is dispatchable but produces emissions that present economic and regulatory problems.
- **Green Power** is power generated from plants based on renewable energy; it has zero emissions but its output is intermittent and non-dispatchable, requiring backup plants to provide reliability.
- **Purple Power is a new hybrid power product:**
  - Generated by a MADA Energy Processing with Liquid Air Energy Storage (MEPL™) facility that takes in **Green Energy** (renewables) and **Brown Energy** (fossil) and outputs a reliable alternative to CCGT power that is:
    - >80% renewable, backed up by <20% fossil fuel
    - Fully dispatchable, similar to fast-start gas turbine performance
    - PPA energy costs comparable to new CCGT generation, but with significantly less fuel cost risk than for CCGT or for Wind + CCGT
    - Significantly lower CO<sub>2</sub> emissions than Combined Cycle Gas Turbines
    - Satisfies firm capacity requirements
    - Provides bridge from a fossil-based grid to a renewables-based grid

# MADA Energy Processing™ with MADA LAES™

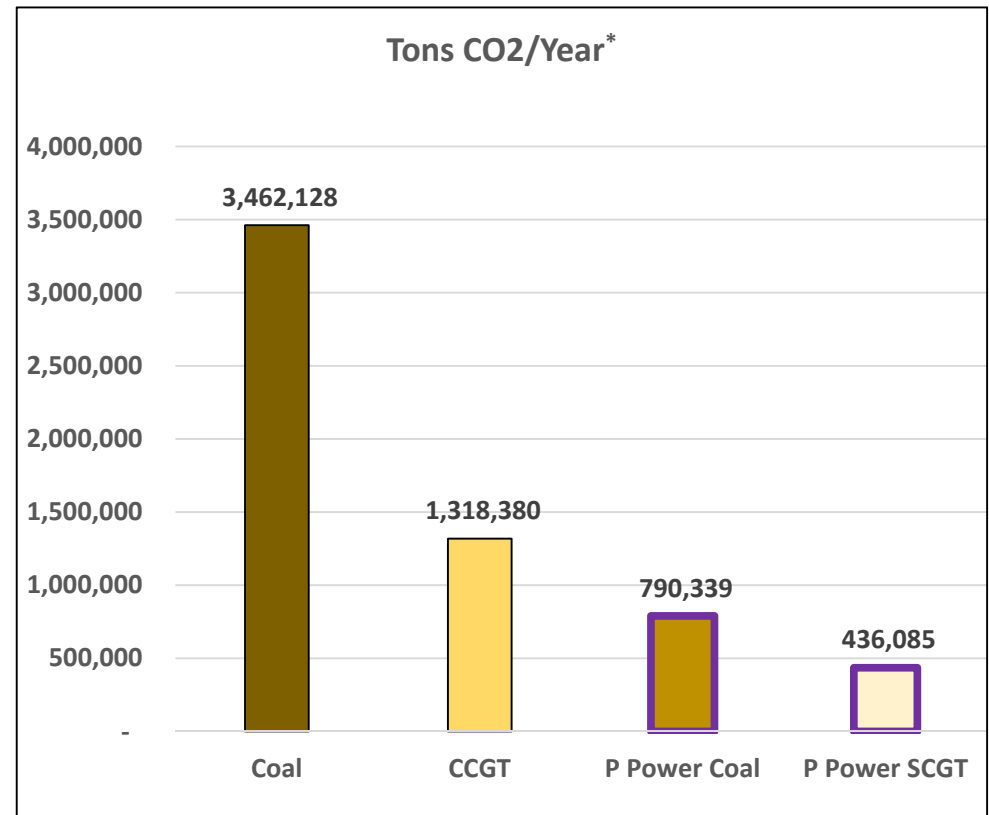
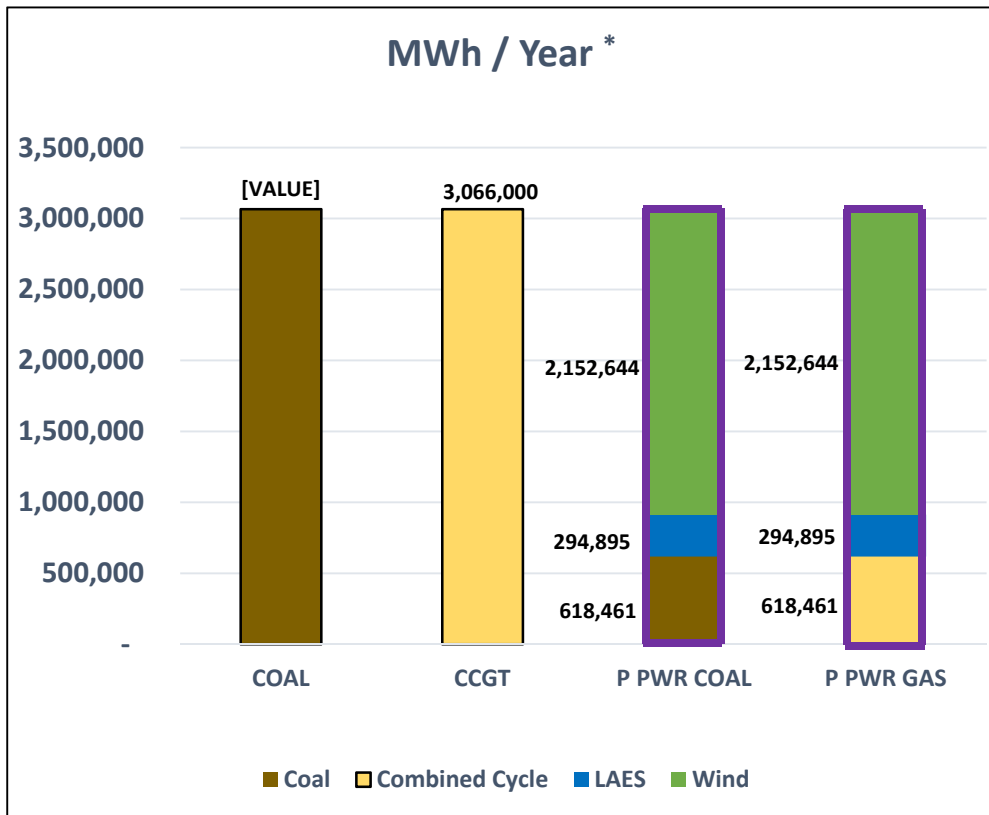
Wind and/or Solar Energy backed by Coal and/or Natural Gas Generation



Click on Play Button for Short Video on MADA Repurposing



# CO2 Emissions: Coal, CCGT, Purple Power w/ Coal Backup, Purple Power/SCGT Backup



## Assumptions (All numbers are indicative):

1. Energy demand 600MW at 60% capacity factor
2. Purple Power targeted wind/fossil fuel ratio is 80/20
3. Purple Power assumes ~1500MW of wind ~300MW MEPL™

# Replacing 600MW of Generation with Purple Power

MADA develops, integrates, builds as necessary, and operates a new generation and storage facility consisting of :

- A MADA Energy Processing Solution (MEPS™) which integrates the renewables, energy storage, fossils fuel elements, and trading.
- ~1500MW of wind/solar (RE) from existing and new sources as necessary from IPPs and utilities which the MEPL™ integrates with energy from storage backed up by fossil generation as required.
- ~300MW/6 hour MADA Liquid Air Energy Storage (LAES) that requires less than 15 acres.
- The facility will provide ancillary services and VAR support.
- Backup power will come from remaining Colstrip units, natural gas, and market purchases to ensure that less than 20% of **PURPLE POWER** energy comes from fossil fuel.

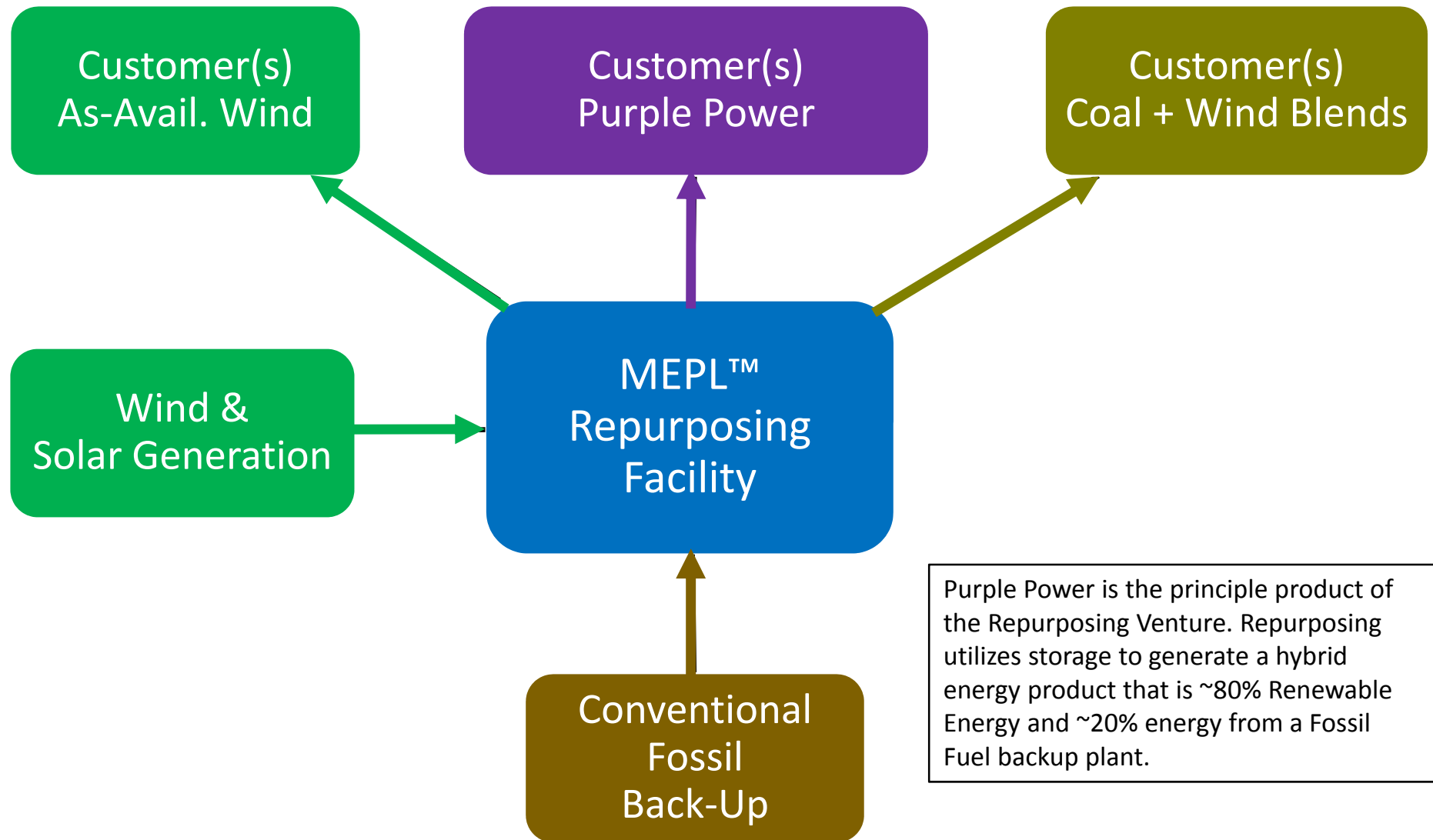
# Benefits of Replacement Program Based on MADA's Purple Power

- Remarkably, MADA's approach backed up by coal results in a >40% CO<sub>2</sub> emission level reduction and >65% CO<sub>2</sub> emission reduction when backed up with a SCGT compared to replacing unit 1 & 2 with a CCGT.
- Not only does MADA's facility reduce CO<sub>2</sub> emissions, the power generated is as **dispatchable** as SCGT and competitive with new CCGT costs.
- Grid reliability and resiliency are maintained with installation of the MEPL™ system with its fossil back-up.
- Renewable energy can be supplied from new and/or existing Montana and Washington generation.
- Implementation of this program with coal will totally satisfy Montana's requirements under rate-based CPP and with gas backup will exceed rate-based CPP requirements.
- Renewable energy can be supplied from new and/or existing Washington generation, contributing to current and future CPP and RPS goals and requirements.

# Power Products Produced by MADA Energy Processing

- 1. Purple Power:** Fully dispatchable hybrid renewable / fossil energy product produced by MADA MEPS™ system.
- 2. As-Available Green Power:** Fully generated from renewable sources, available when more renewable energy is being generated than can be delivered to the grid or to storage.
  - A low cost supply of renewable energy.
  - RECs are supplied in addition to the energy.
- 3. Blended Fossil/Renewable Power:** Fossil power mixed (or blended) with available renewables in a in unspecified ratios:
  - **Blend A:** MADA blends Green Power (retaining RECs, thus priced below market) with Brown Power to produce a product lower in cost than Brown Power alone.
  - **Blend B:** MADA blends Green Power with Brown Power and prices the Blended Product based on the average annual ratio of Green Power in the blend. This Blended Product can be sold for a premium to “green conscious” customers.

# Indicative Repurposing Contract Structure



# The MADA Team

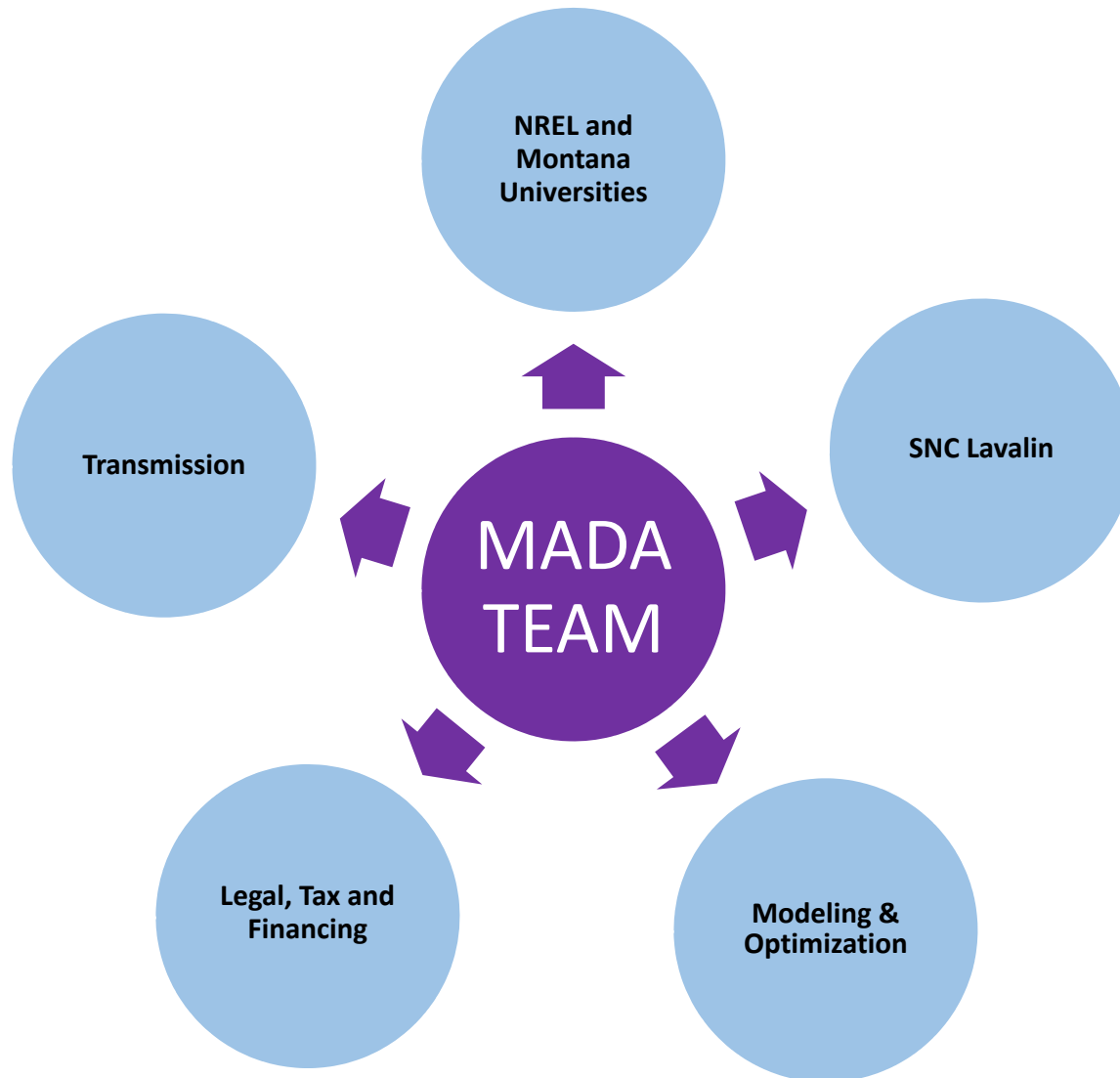
## MADA Power

- Negotiate PPAs
- Project Development
- Project Management
- Deal Structures
- Project Finance
  - Concepts
  - Framework
  - DOE loan guarantees

## MADA Energie

- Provide IP technology and conceptual design for MEPL™ and MEPS
- Optimization of system operation
- Define optimum energy products
- Support financial modeling of MP
- Technology management and integration
- Vendor financing

# The MADA Team



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