GRANDFATHER SUN

% HYDROGEN 20% HELIUM

r second: 386 Billion- Billion Watts is produced by the Nuclear Fusion Reactions.

nile traveling at the speed of light its energy reaches Earth and is the primary light we see.
at takes 8 seconds to travel from there to here.

D.C. Energy travels in a wave length similar to the way a water stream flows. We invert it t
C. which is a square wave length to run in our buildings.

wave energy has a weight – 40 million tons of Energy Lands on Earth everyday.

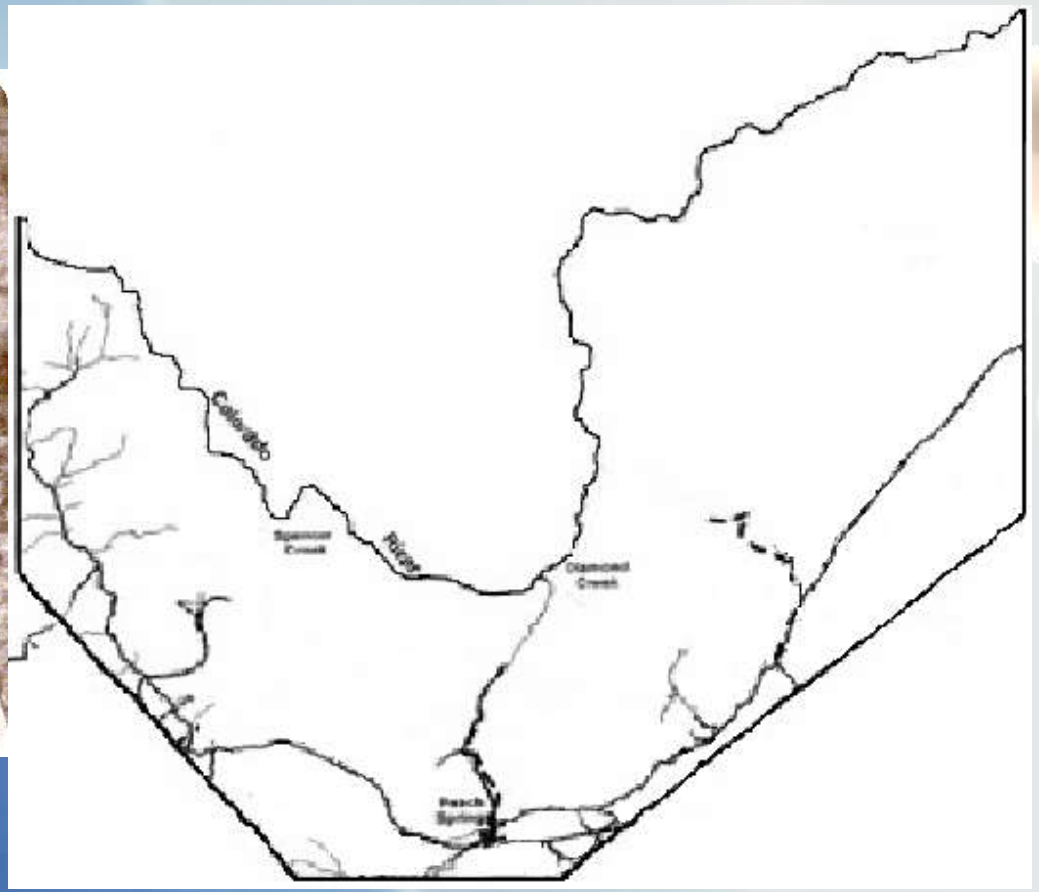
is Photon Energy that feeds all life to grow, is the same photons that we collect on a Solar
llector to produce electricity. Thus the photosynthesis process of light on our green earth ar
otovoltaic for the collect of sunlight for electric energy.

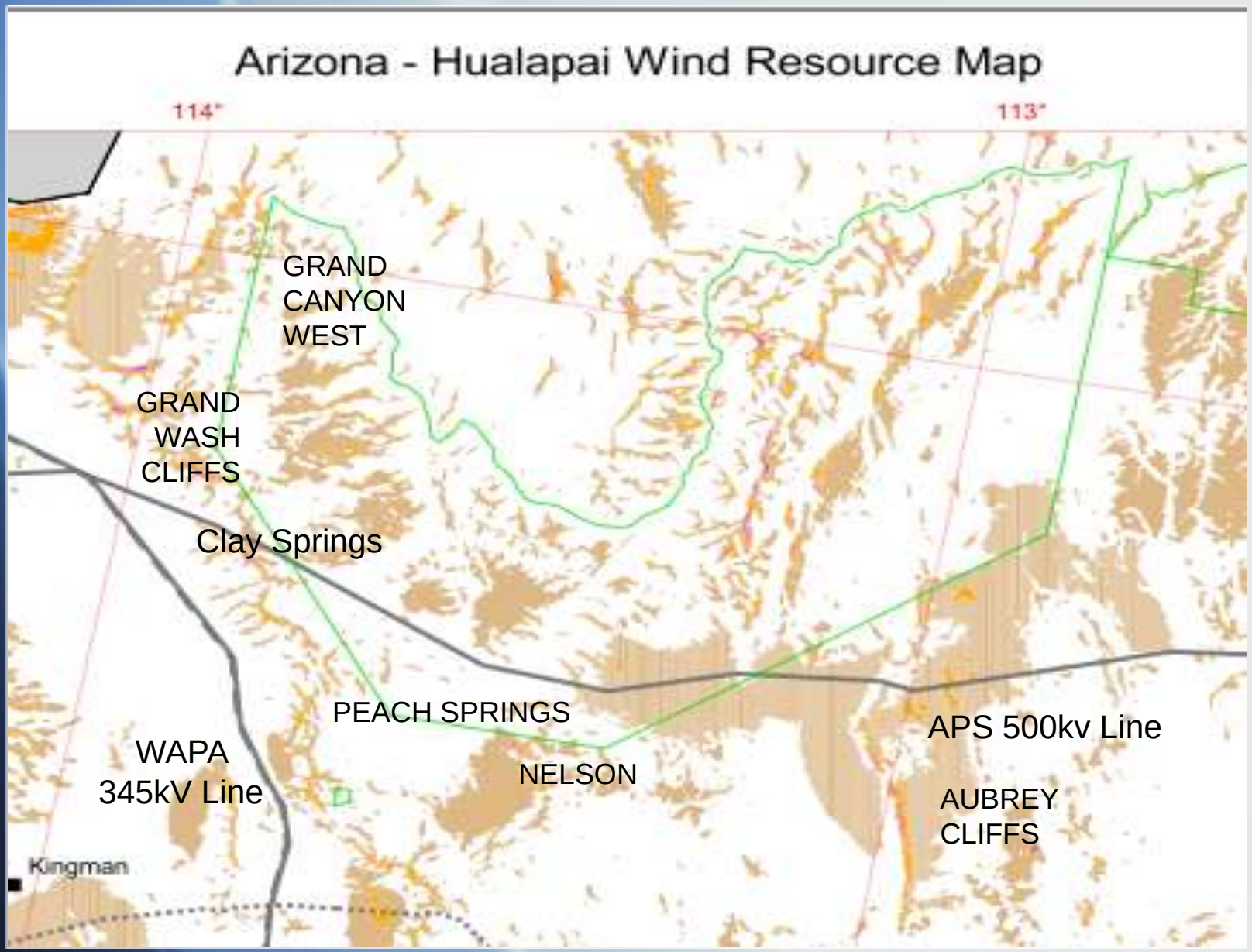
0 mile by 100 mile of solar panels can run the whole U.S. ---D.O.E. Quote.

Hualapai Tribal Energy Program

October, 2010

Hualapai Reservation




Arizona - Hualapai Wind Resource Map
114°
113°
GRAND
CANYON
WEST
GRAND
WASH
CLIFFS
Clay Springs
PEACH SPRINGS
APS 500kv Line
WAPA
345kV Line
NELSON
AUBREY
CLIFFS
Kingman

Solar Water Pipeline 1997 to Present

- USDA Water Project
- Upgraded to provide water to Grand Canyon West Tourism area
- Currently being upgraded for increased flow and domestic water quality improvements

Earthship Project - 1999

- Funded by DOL Jobs in Recycling program
- Built by WIA workers
- Solar PV
- Water Catchment system

Guano Point 2000

- Off Grid 7 kilowatt PV and wind system
- Power for lights, kitchen, and cooling
- Recently upgraded and repaired new wind turbine, new batteries

GCW Solar Power System
2005 -2008

- 2 100Kw solar -diesel hybrid non-grid tied systems with 16kW solar- and 5400amp hour battery banks. Latest SatCon digitally integrated Inverters
- 50% -70% reduction in generator run time.

Hualapai Tribal Utility Feasibility Study

DOE First Steps 2005

1. Feasibility of Stand Alone Utility Providing Service at Grand Canyon West -
2. Feasibility of Take-over of Reservation Electric Service from Local Co-op -
3. Feasibility of integrating Hualapai Wind Resource to meet tribal load-

Hualapai Wind Assessment Project
BIA-MAP 2005 - 2009

Overview

- Assess Wind Resources
  - Grand Canyon West - 35% Capacity @ 6mps
  - Peach Springs Area -20% capacity @ 5.5mps
  - Nelson - 25% Capacity @ 5mps
  - Clay Springs Study Started
- Feasibility Study
  - Phase I Environmental Screening Completed
  - Avian Impact Assessment Completed
  - Interconnection Study underway
  - Wind Development Partner Identified

MOUs

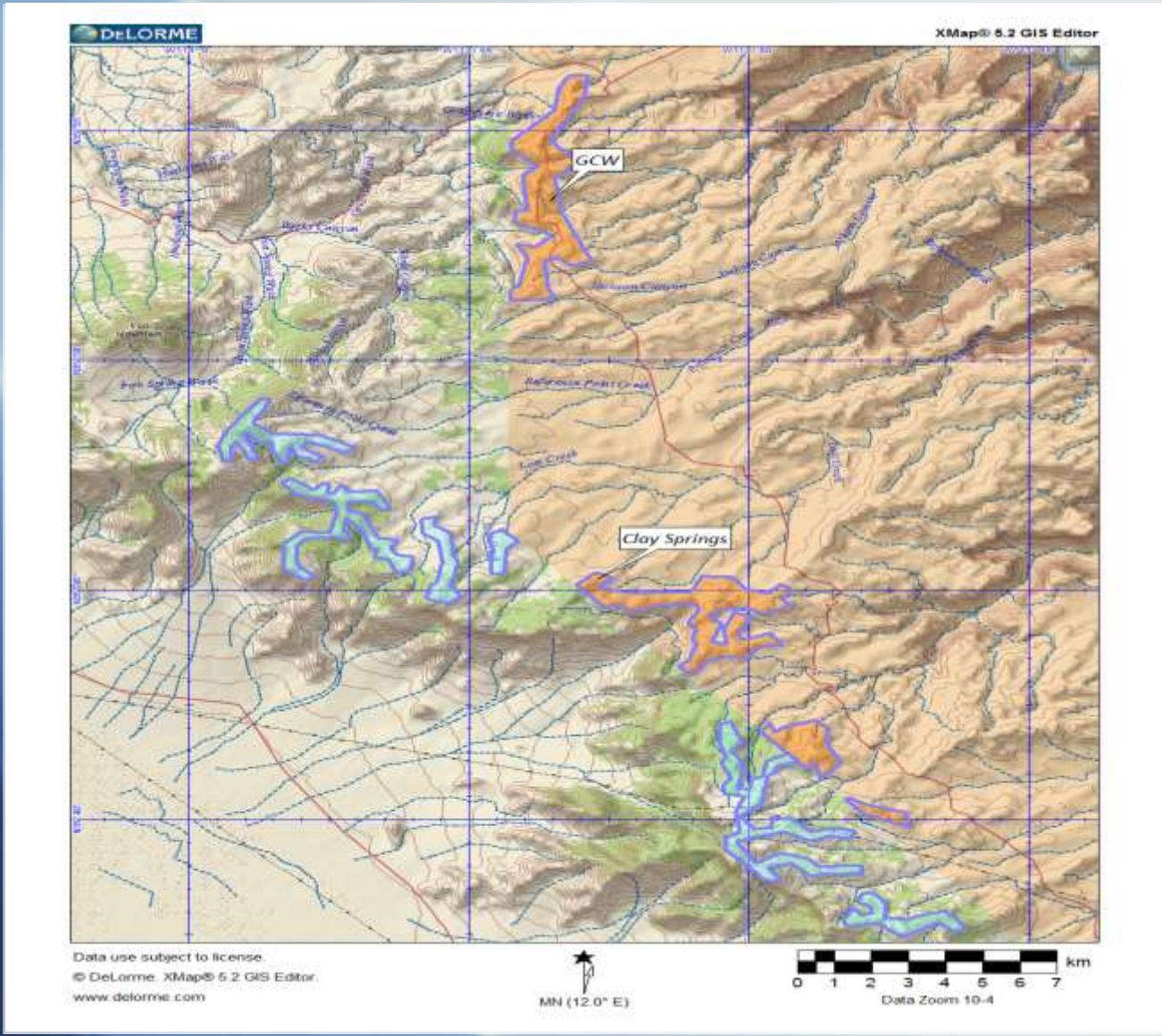
- Clipper Windpower Development Company
  - Complete Final Wind Farm Feasibility
- Mohave Sun Power, LLC
  - Complete Transmission &Interconnection
  - Complete PV Solar Power Plant Feasibility

- Manufacturer of Clipper wind turbines
- Developer of wind farm projects
- Priority for Native American Wind Farm Projects

hualapai valley solar™
a mohave sun power project

340 MW Concentrating Solar Power Facility

Grand Canyon West - Clay Springs Wind Farm



Clay Springs Solar- GCW Wind Project Concept

Transmission and Interconnection

- Hualapai Valley Solar - leads interconnection to WAPA system
- WAPA wants diversity -Solar CSP, PV Solar, and Wind. High priority for Native American projects
- WAPA funding to build interconnection substation & upgrade existing lines
- HVS - Connections to other APS- SCE transmission lines and power markets

Benefits of Renewable Energy Development

- Reliable Revenue Stream to the Tribe
  - Lease / Royalty Payments
  - Co-Ownership Revenues
- Jobs
  - Construction
  - Construction Support
  - On-going Operations
- Power Connection to Grand Canyon West
- Tribal Electric Utility control on Reservation

Funding Support

- DOE Tribal Energy Program
  - Wind Farm Business Development Phase
- BIA Energy and Mineral Development Program
  - Solar Power Plant Feasibility and Planning

Phase II - Business Development

- Business modeling
  - Ownership Scenarios & Financing Options
    - Tribal
    - Partnership
    - Lease to Developer
- Transmission and Interconnection Study
- Pre-Environmental Assessment
- Detailed Site planning
  - Turbine locations, roads, interconnections,
- Final Project Feasibility Determination
- Go -No-Go Decision on Joint Venture Development

Participants

- Clipper Windpower & Mohave Sun Power
  - Economic Modeling, Business planning
  - PPA research
- V-Bar
  - Wind Resource & Site Assessment, Turbine Placements
- PDS Consulting
  - Interconnection Study
- Daystar Consulting, LLC
  - Project Management,
- RECON Environmental
  - Environmental Assessment

Supply & Demand

- Population growth and power demand will increase 3 times faster than supplies.
- Dependence on current sources will have a devastating affect.

WESTERN AREA POWER ADMINISTRATION

ANNUAL REPORT 2009

MISSION

Market and deliver clean, renewable, reliable, cost-based Federal hydroelectric power and related services

VISION

Provide premier power marketing and transmission services

ABOUT WESTERN

Western is a Federal agency under the Department of Energy that markets and transmits wholesale electrical power through an integrated 17,000-circuit mile, high-voltage transmission system across 15 western states.

Employees work around the clock to sell power, operate transmission and provide maintenance and engineering services to:

- Cooperatives
- Federal and state agencies
- Municipalities
- Native American tribes
- Other energy service providers
- Public utility and irrigation districts

In turn, our customers provide electric service to millions of people from as far south as Texas all the way north to the Dakotas, and from the plains of Minnesota to the California coastline.

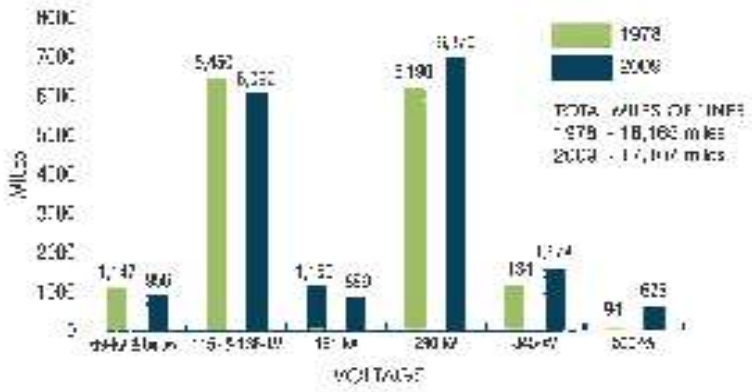
In 2009, Congress expanded Western's role to include the Transmission Infrastructure Program. Through funding partnerships, TIP will develop transmission infrastructure that delivers renewable energy across the grid in the West.

For more than 30 years, Western employees have been dedicated to providing public service, such as promoting environmental stewardship, energy efficiency and renewable energy, as well as implementing new technologies to ensure our transmission system continues to be the most reliable possible.

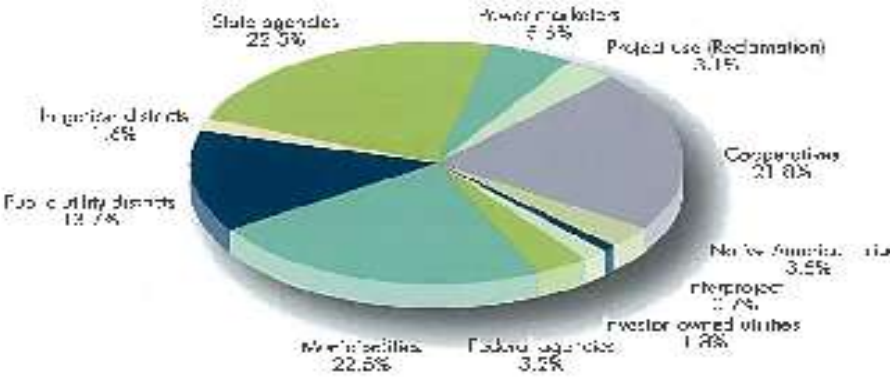
WESTERN AT A GLANCE (unaudited)

MARKETING PROFILE	FY 2009
Long-term energy sales	billion kWh
Other energy sales	1.2 billion kWh
Total	35.2 billion kWh
FINANCIAL PROFILE	
Sales of electric power	$1,014.2 million
Total operating revenues	$1,363.7 million
Total operating expenses	$1,231.9 million
Purchased power and transmission expenses	$610.2 million
ASSETS	
Powerplants	57
Installed capacity (MW)	10,489
Substations	308
Transmission line miles	17,107
OUR PEOPLE	
Customers	687
Employees	1,427
PEAK LOAD	
July 14, 2009	6,531 MW

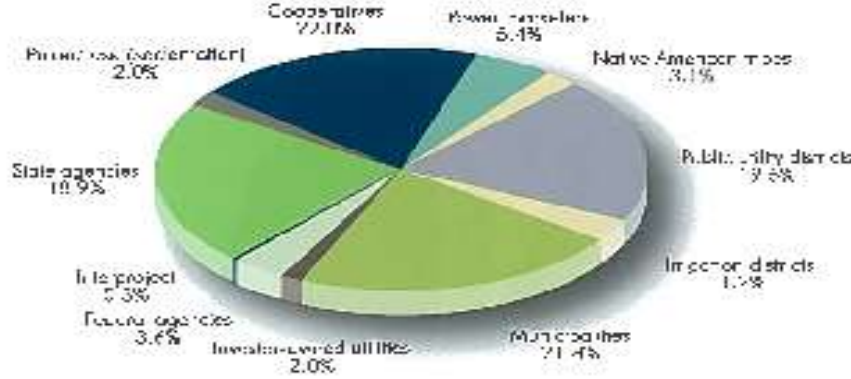
TRANSMISSION LINES IN SERVICE
as of Sept. 30, 2009



WHERE OUR ENERGY GOES (MWh)



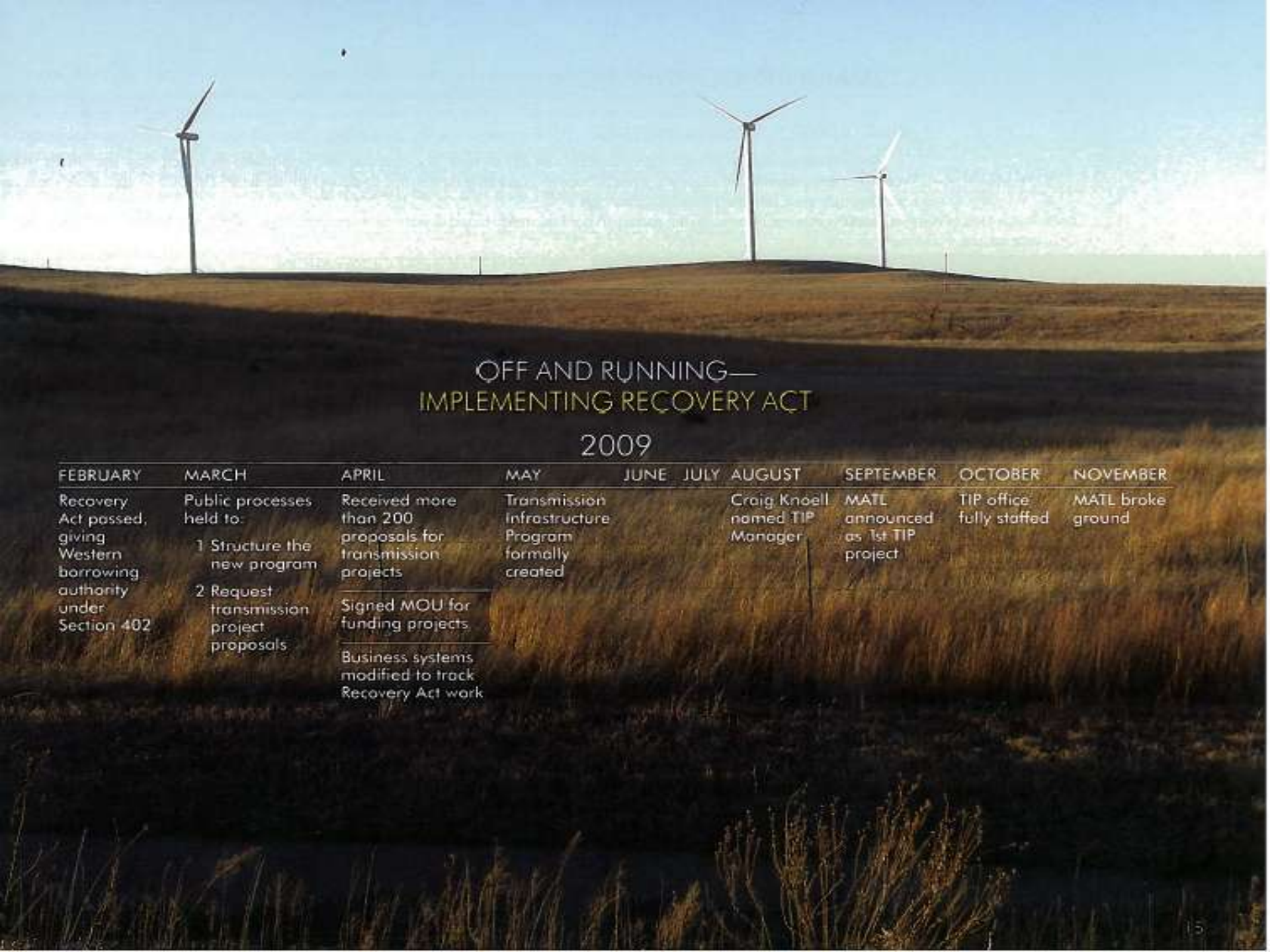
WHERE OUR REVENUES COME FROM ($)



CONNECTING CALIFORNIA TO ENERGY SECURITY

Relying upon our connection with our West Coast customers, we implemented solutions to correct the market design flaws that caused the California energy crisis in 2000 and 2001. With the California Independent System Operator's deployment of the new Market Redesign Technology Upgrade, MRTU, on April 1, 2009, Western's Sierra Nevada Region, SN, stepped up to make sure its business processes and systems seamlessly transferred and operated in the newly redesigned market with minimal impacts to our customers.

Western's SN Regional Manager Tom Boyko attributes the successful transition to teamwork and strong leadership. "It takes a team effort to be successful, as everyone must pull the oars in the same direction and at the same time," observed Boyko. "I was gratified to see that so many people stepped up to ensure that SN's MRTU go-live transition went smoothly." Under MRTU, California's power prices are now calculated using a market-based, economic dispatch methodology known as Locational Marginal Pricing.



OFF AND RUNNING—
IMPLEMENTING RECOVERY ACT

2009

FEBRUARY

Recovery Act passed, giving Western borrowing authority under Section 402

MARCH

Public processes held to:

1. Structure the new program
2. Request transmission project proposals

APRIL

Received more than 200 proposals for transmission projects

Signed MOU for funding projects

Business systems modified to track Recovery Act work

MAY

Transmission Infrastructure Program formally created

JUNE

JULY

AUGUST

Craig Knoell named TIP Manager

SEPTEMBER

MATL announced as 1st TIP project

OCTOBER

TIP office fully staffed

NOVEMBER

MATL broke ground


CLIMATE
SUMMIT
WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?
• ENERGY INDEPENDENCE
• PRESERVE RAINFORESTS
• SUSTAINABILITY
• GREEN JOBS
• LIVABLE CITIES
• RENEWABLES
• CLEAN WATER, AIR
• HEALTHY CHILDREN
• ETC. ETC.
JOEL PETT