

Glen Canyon Dam Adaptive Management Work Group
Agenda Item Information
September 9-10, 2008

Agenda Item

Hydropower Economics

Action Requested

√ Information item only. We will answer questions but no action is requested.

Presenter

Brad Warren, Manager, CRSP Management Center, Western Area Power Administration

Previous Action Taken

N/A

Relevant Science

N/A

Background Information

The presentation will cover the following outline:

Basin Fund

- Law, policy, and decision-making that affect management of the Basin Fund.
- Is it possible for the Basin Fund to default? If so, what happens to the various programs funded by the Basin Fund?
- What happens to the Basin Fund once the dam, transmission lines, etc. are repaid?
- Actual or projected sources of income for the Basin Fund in WY2007 and 2008.
- Are all revenues generated by CRSP facilities deposited in the Basin Fund?
- Actual or projected expenditures for the Basin Fund in WY2007 and 2008.

WAPA's rates/contracts

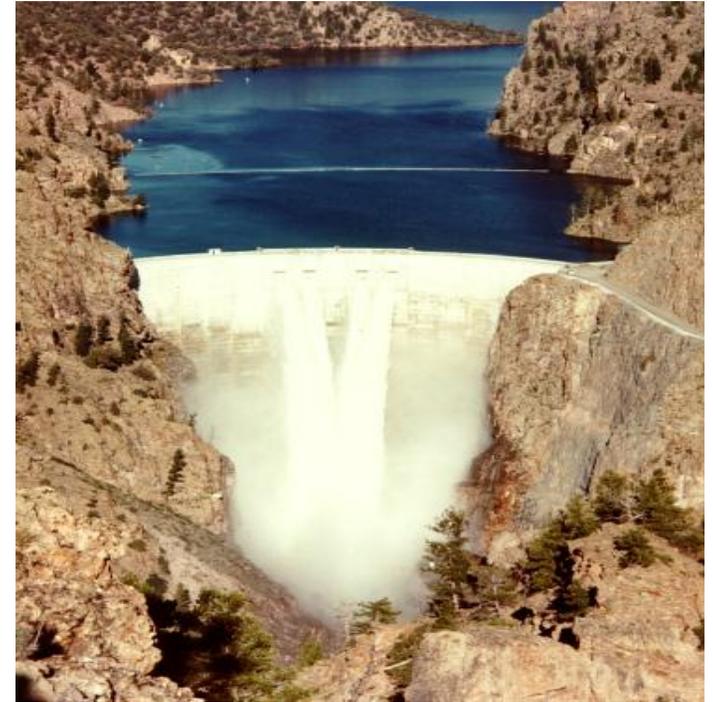
- How WAPA contracts for power (distinguish between capacity, energy and composite rate).
- How season and time of day affect rates charged by WAPA.
- How the CRSP generating facilities fit into the electrical needs of customers.
- How Glen Canyon power production fits into the CRSP system.
- Overview of CRSP customers – where do they serve, who do they serve.
- How do the rates charged by WAPA for power from Glen Canyon Dam compare to the cost of power on the open market?
- How do WAPA rates affect the retail prices charged by CRSP customers?

Costs of the 2008 BHBF

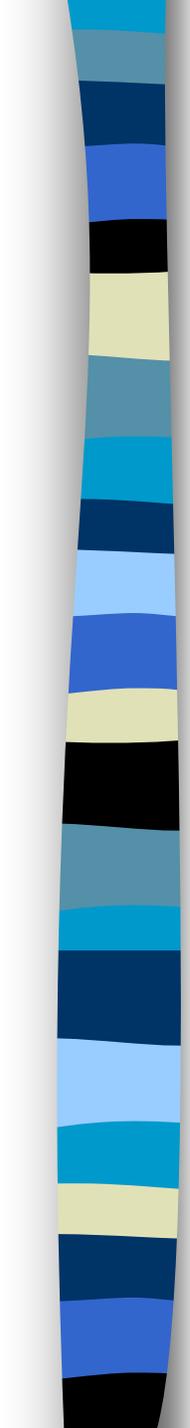
- Actual or projected costs of the 1996, 2004, and 2008 BHBF attributed to water routed through the bypass tubes v. replacement power costs v. other costs.
- Which costs are reimbursable and which are non-reimbursable.

COLORADO RIVER STORAGE PROJECT

Hydropower and the Basin Fund

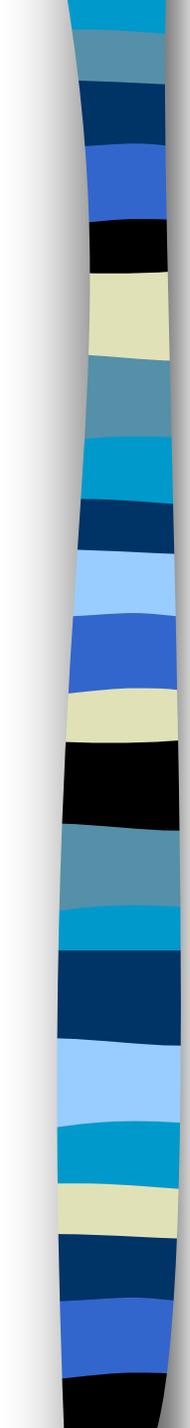


BRADLEY WARREN
Manager,
Colorado River Storage Project
Western Area Power Administration



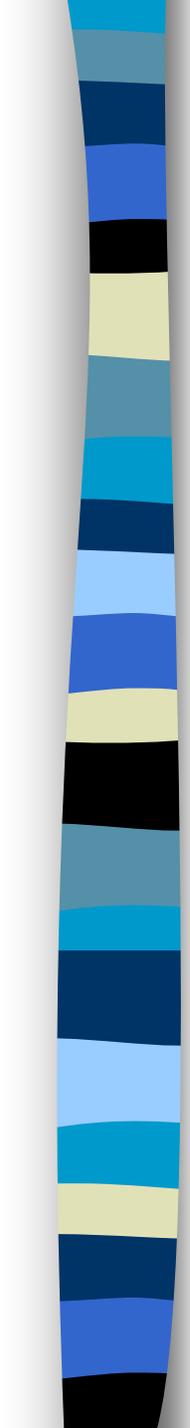
What Western is

- Western is an agency of the U.S. Department of Energy
- Established in 1977 by transfer of Power Marketing functions from USBR
- One of four Power Marketing Administrations covering most of U.S



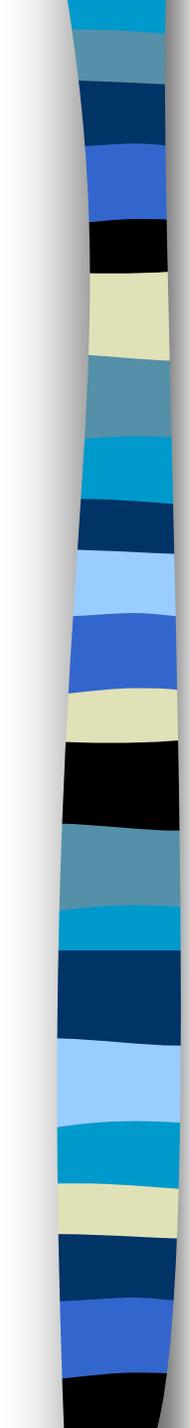
What Western does

- Markets Hydroelectric Generation - 10,564 MW from 55 power plants
- Delivers power over a 16,819 mi. high voltage transmission system
- Delivers to 643 wholesale customers in a 15 state service area



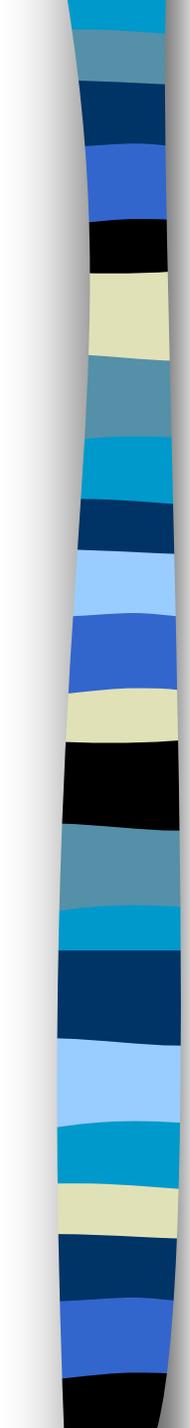
Electrical Terms

- **MegaWatt (MW):** 1 million watts or the power required to light 10,000 100 watt light bulbs simultaneously
- **One MegaWatt hour (MWh):** energy consumed to light 10,000 light bulbs for 1 hour or 1 light bulb for 10,000 hrs



CRSP Mainstem Power Facilities

- **Glen Canyon – 1,356 MW**
- **Flaming Gorge – 152 MW**
- **Aspinall Units**
 - **Blue Mesa – 60 MW**
 - **Morrow Point – 156 MW**
 - **Crystal – 29 MW**



Other SLCA/IP Generation Resources

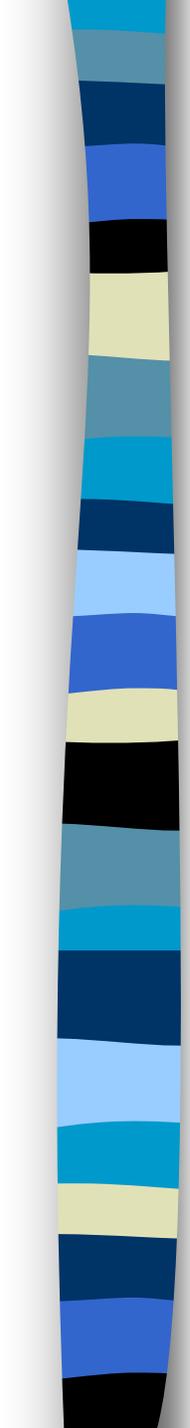
- Fontenelle (WY) – 10 MW
- Elephant Butte (NM) - 28 MW
- Upper Molina (CO) - 9 MW
- Lower Molina (CO) - 5 MW
- McPhee - (CO) 1 MW
- Towaoc - (CO) 11 MW

CRSP MC Marketing Area



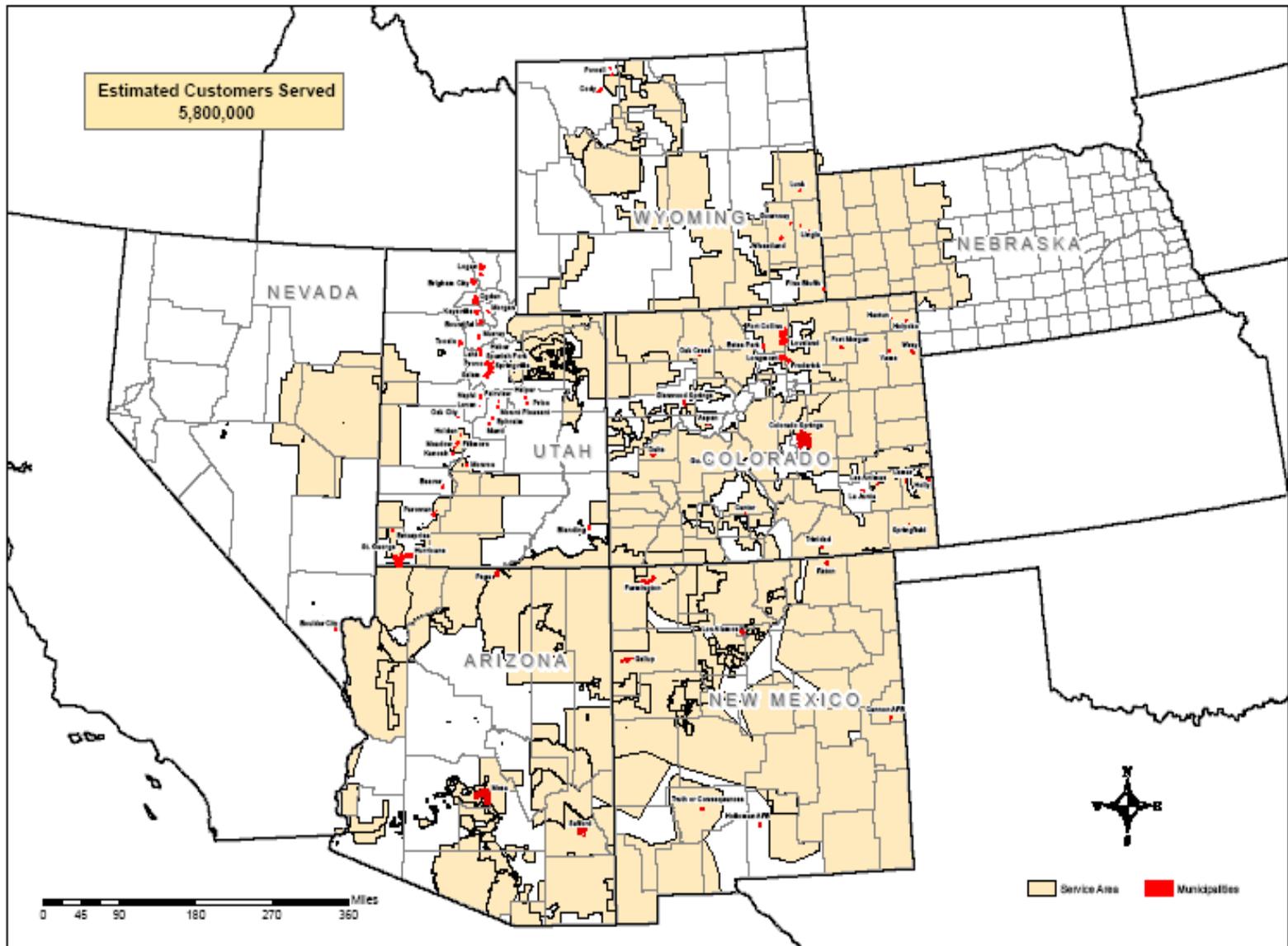
MARKETING AREA BOUNDARIES

- ◇ CRSP Management Center
- Falcon-Amistad Project
- Provo River Project
- Salt Lake City Area/Integrated Projects
Colorado River Storage Project, Collbran, Rio Grande,
Seedskadee and Dolores projects



CRSP Electrical Customers

- Rural Electric Coops
- Municipal Utility Systems
- Native American tribes (53)
- Federal facilities
- State Institutions (such as universities)
- Irrigation districts

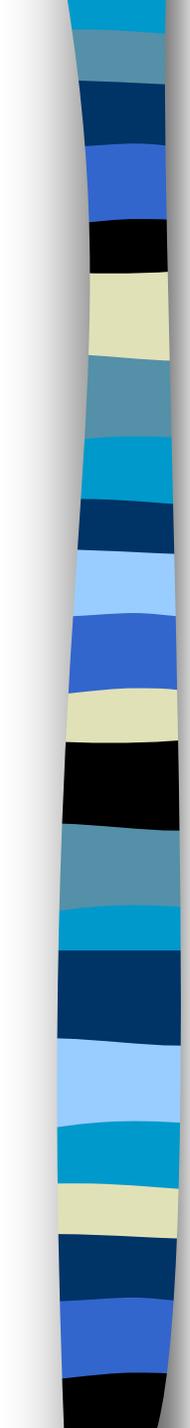


**The Colorado River Storage Project
Management Center Service Territory**

DISCLAIMER:
The data represented on this map has been developed from the best available sources. Although efforts have been made to ensure that the data is accurate and reliable, errors may exist. The data on this map is for reference use only. Population figure generated from U.S. Census year 2000 data.

Western Area Power Administration
An agency of the U.S. Department of Energy
**The Colorado River Storage Project
Management Center**

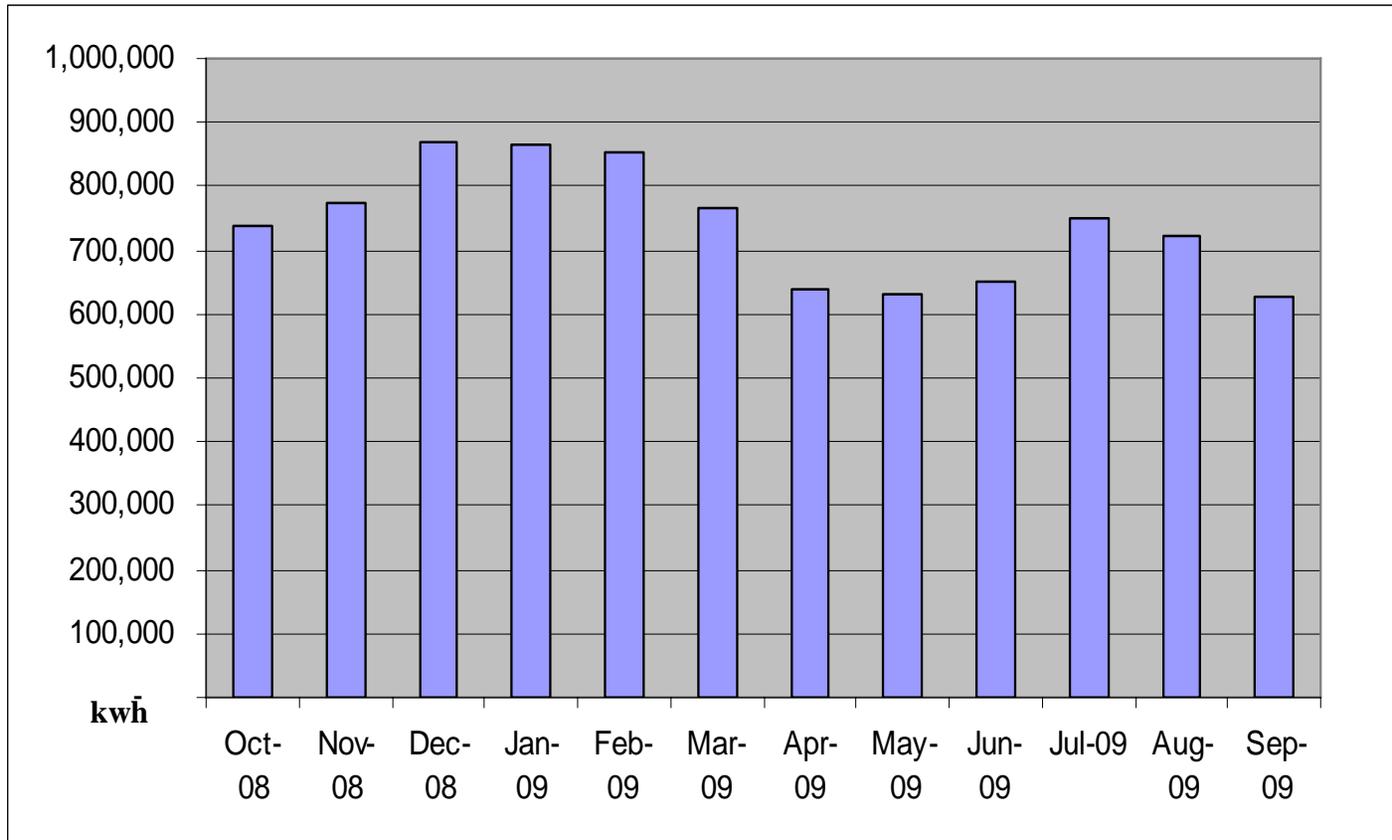
Revised January 30, 2005



Federal Marketing of SLCA/IP Power

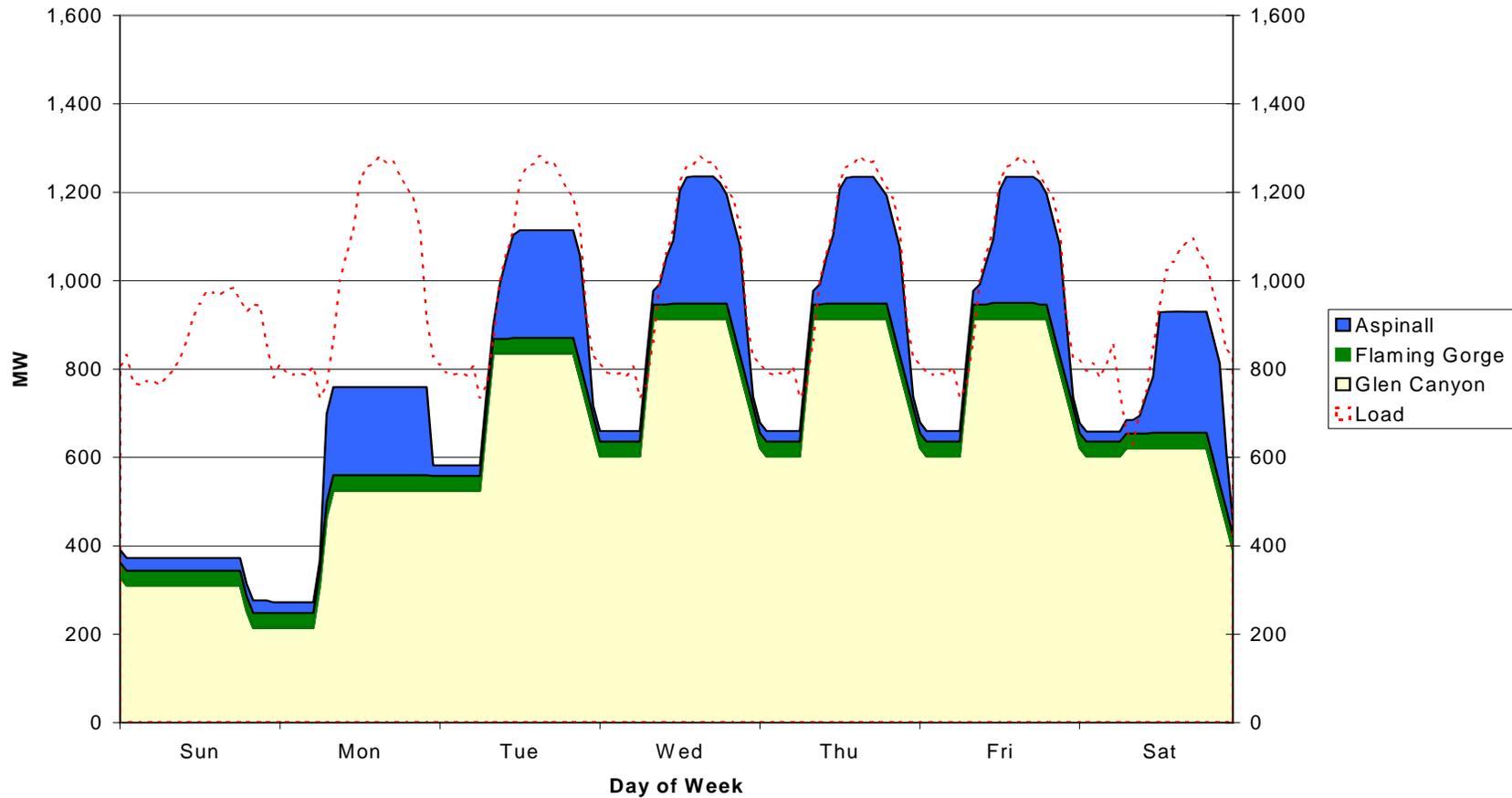
- Power is marketed by primarily by project (CRSP, Parker-Davis, Pick-Sloan, etc.)
- CRSP – MC determines long-term resource availability
- Applicants for power submit a demand “profile”
- Western makes marketing determinations based on a public process
- Allocations of Federal hydropower and contractual terms are determined
- Allocated as a single resource (not specific to each powerplant)
- Western enters into long-term contracts

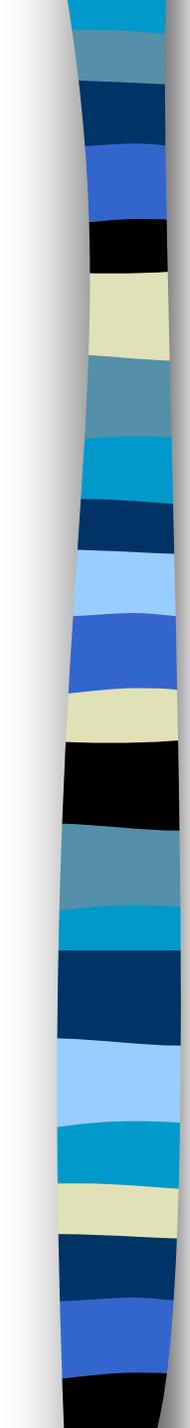
SLCA/IP SHP Capacity Levels by Month



Typical CRSP Weekly Generation Pattern

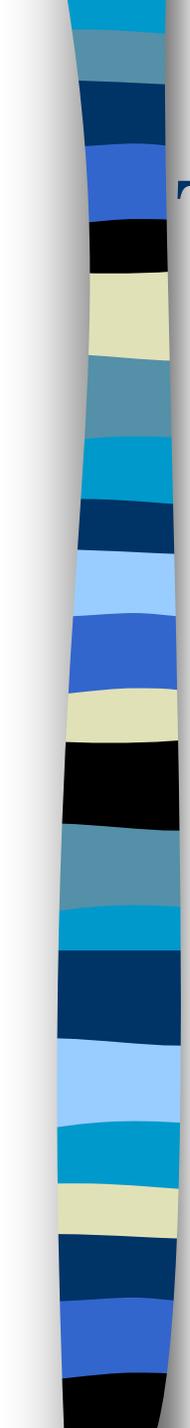
CRSP Generation After Glen Canyon ROD and Flaming Gorge BO





How SLCA/IP Customers Use Electrical Energy from CRSP

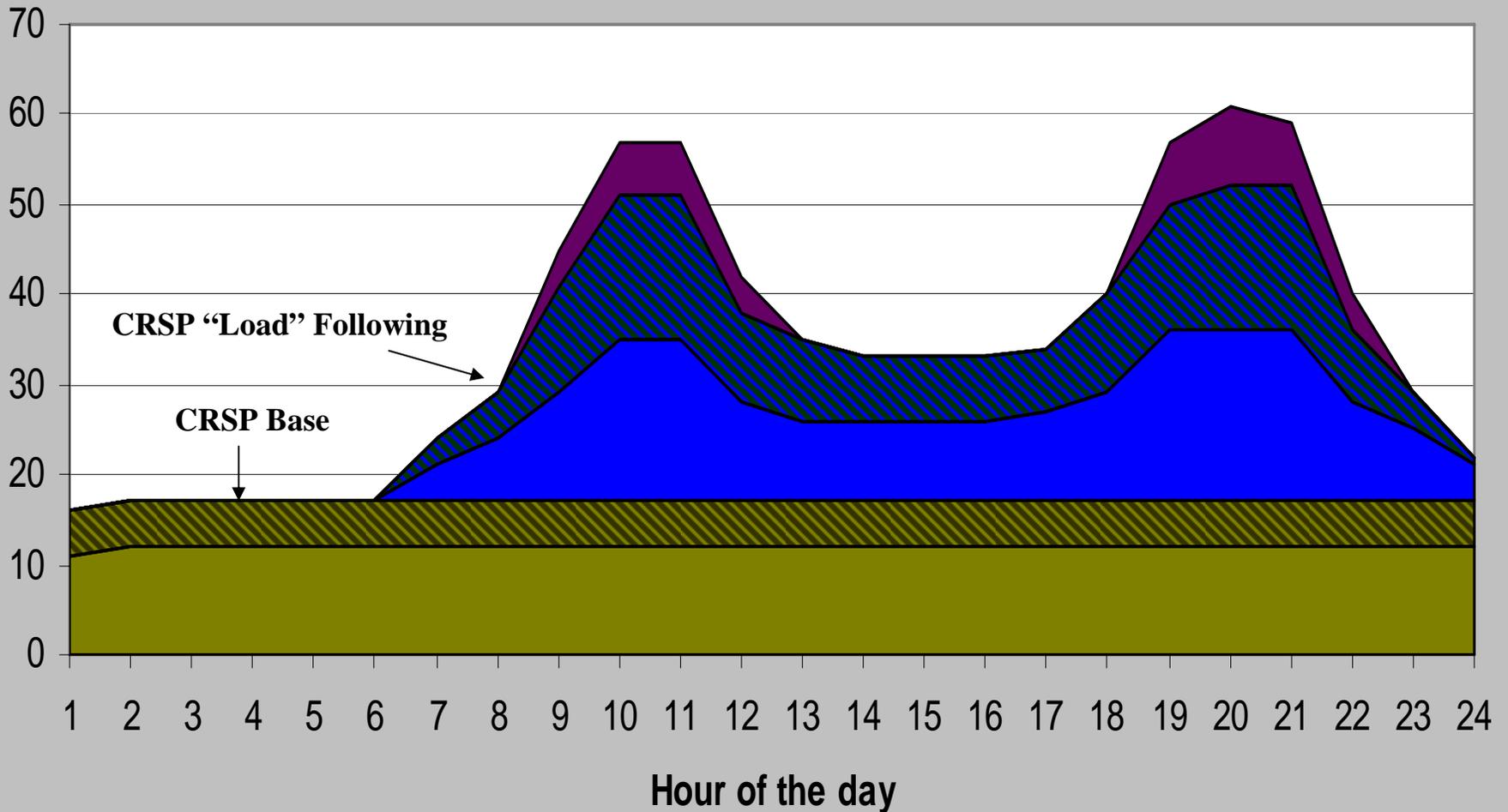
- CRSP power is not a customer's sole resource
- Customers are allowed some flexibility in scheduling electrical energy from WAPA
- Customers schedule hourly to assist in meeting retail electrical demand. Hourly schedules are limited to:
 - **A maximum amount per hour**
 - **A minimum amount per hour**
 - **A total amount of energy within a month**



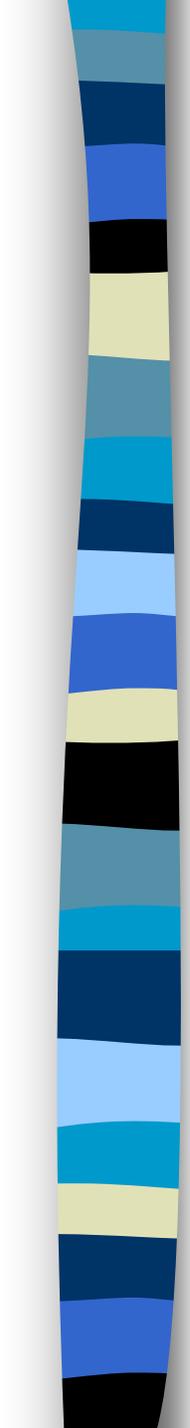
Typical SLCA/IP Customer Scheduling

- Customers use the energy scheduled derived from the “minimum take” requirement as a “base” resource
- Customers use the flexibility to schedule electricity hourly according to demand – this is: “load following”
- “load following” occurs up to the maximum capacity allowed under the contract

Total Retail Demand & Generation "stack" for a Winter Day



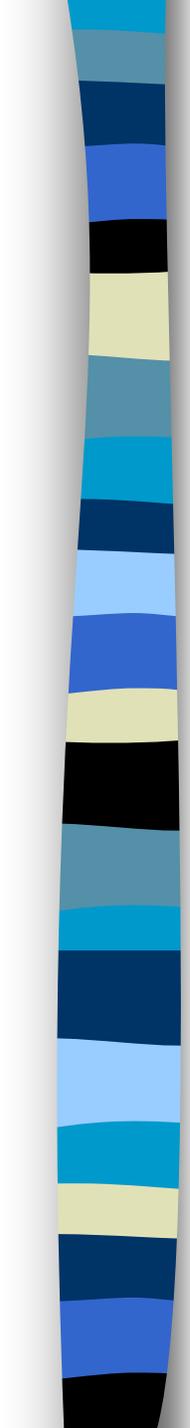
Baseload
 CRSP base
 Natural Gas Unit
 CRSP load following
 Peaking Unit



SLCA/IP Firm Power Rates

Rates are set to recover:

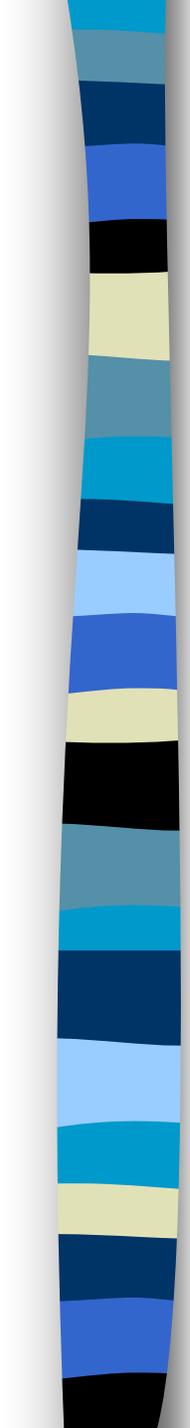
- Annual O&M expenses for WAPA & USBR
- Annual expenses for purchased power and transmission
- Capital investment costs
- Interest on capital investment
- Cost sharing for the Colorado River Basin Salinity Control Program
- Costs assigned to irrigation for repayment that are beyond the irrigators' ability to pay
- WAPA's share of UC & SJ RIP capital costs
- State apportionment obligations



SLCA/IP Firm Power Rates

Rates are NOT set to recover:

- Glen Canyon Dam Adaptive Management Program expenses
- Upper Colorado River RIP O&M expenses
- San Juan Basin RIP O&M expenses



At what price?

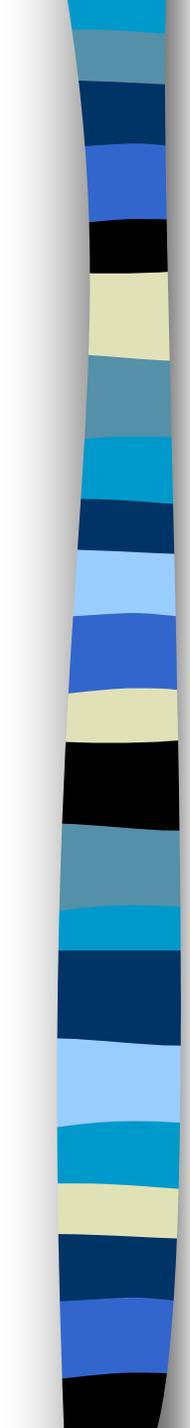
- Cost based rates
- Hydropower is inexpensive to produce: there is no fuel cost
- Rates include repayment assistance to water development projects including State apportionment
- Retail rates of SLCA/IP electrical coop & irrigation customers are typically higher than in privately owned utility service areas
 - rural areas generally require larger investments in transmission and distribution lines per customer



SLCA/IP Rates (effective 10/1/08):

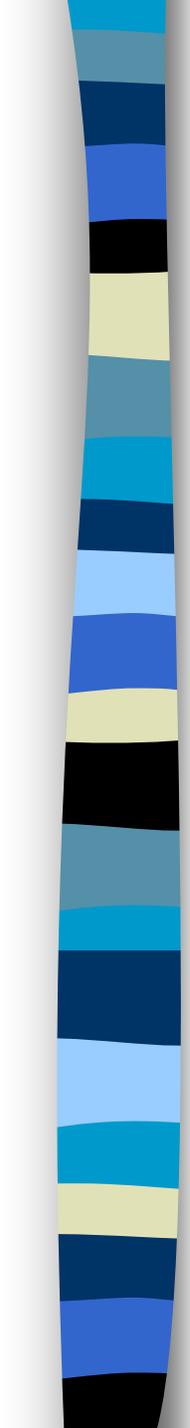
- \$4.70 per KW-month for capacity
plus
- \$0.01106 per kWh for energy

or
- \$0.02680 per kWh – composite rate



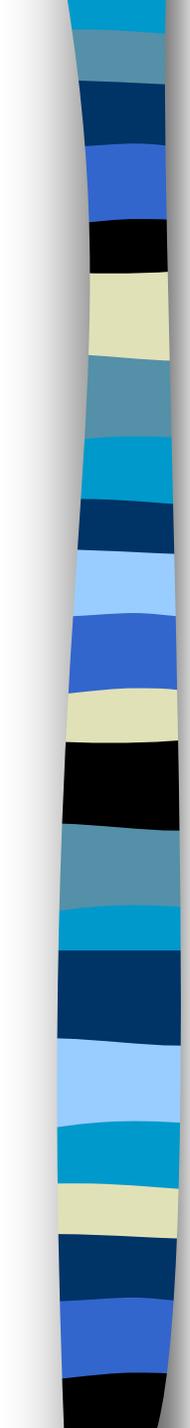
“...The Government of the United States markets power to serve the public interest, not to make a profit.”

— *Stewart Udall*



Basin Fund (Power Only)

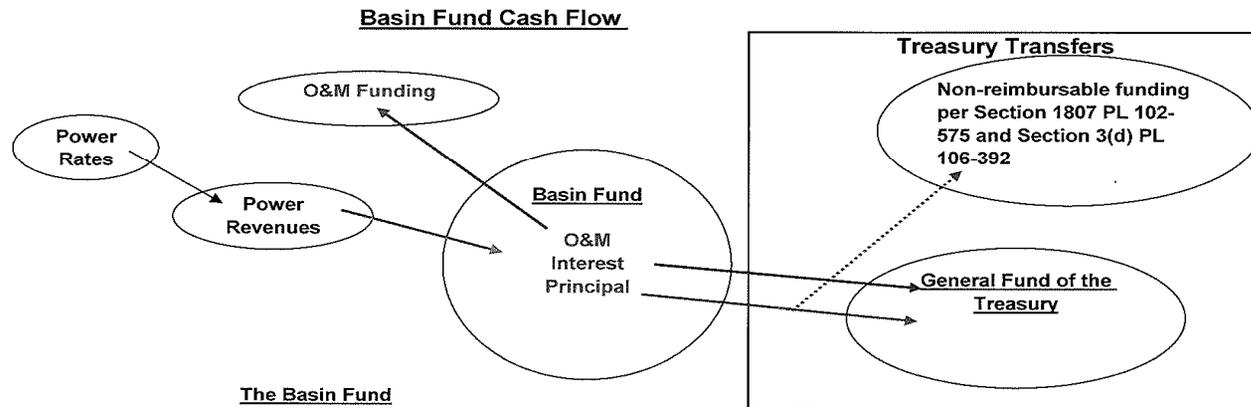
- Established by the CRSPAct of 1956, Section 5
- The CRSP “checking account”
- Power Revenues from sales of capacity, energy, and transmission services
- Total Power Revenues of approximately \$180M/yr



Basin Fund Expenses

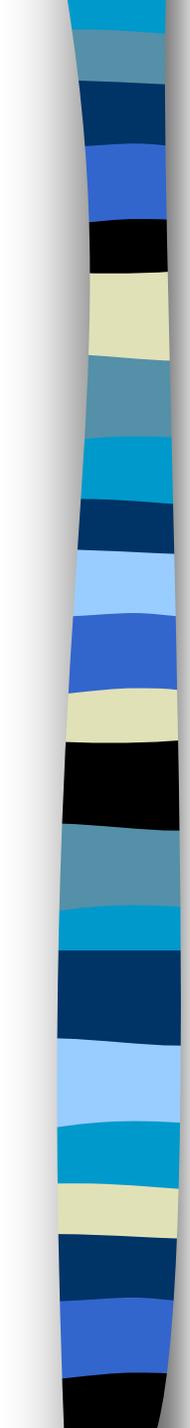
- O&M expenses for WAPA & USBR
- Purchased power and transmission
- Capital investment repayment
- Interest on capital investment
- Cost sharing for the Colorado River Basin Salinity Control Program
- UC & SJ RIP costs
- Adaptive Management Program costs

Cash Flow Diagram



The Basin Fund

1. Receives all power revenues
2. Funds future OM&R costs
3. Transfers P&I to General Fund
4. Funds non-reimbursable costs
5. Maintains contingency balance



Treasury Transfers

- Repaid approximately \$1.3 Billion in principal and interest
 - \$1.0 Billion of cash transfers to the General Fund
 - \$395 Million constructively returned (non-reimbursable funds)

Questions?



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CRSP Manager

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