

# SWAT TRANSMISSION PLANS

November 16, 2011

# SWAT Utilities

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- ❑ Arizona Public Service
- ❑ El Paso Electric
- ❑ Imperial Irrigation District
- ❑ NV Energy
- ❑ Public Service Company of New Mexico
- ❑ Salt River Project
- ❑ Southwest Transmission Cooperative
- ❑ Tucson Electric Power Company
- ❑ Western Area Power Administration – Desert Southwest

# Ten Year Plans

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- ❑ Ten year plans are under development
- ❑ Project names, dates, and routes are still subject to change from information presented today
- ❑ Only high-level summary information is presented.
- ❑ Please contact utilities directly for more information

ARIZONA PUBLIC SERVICE



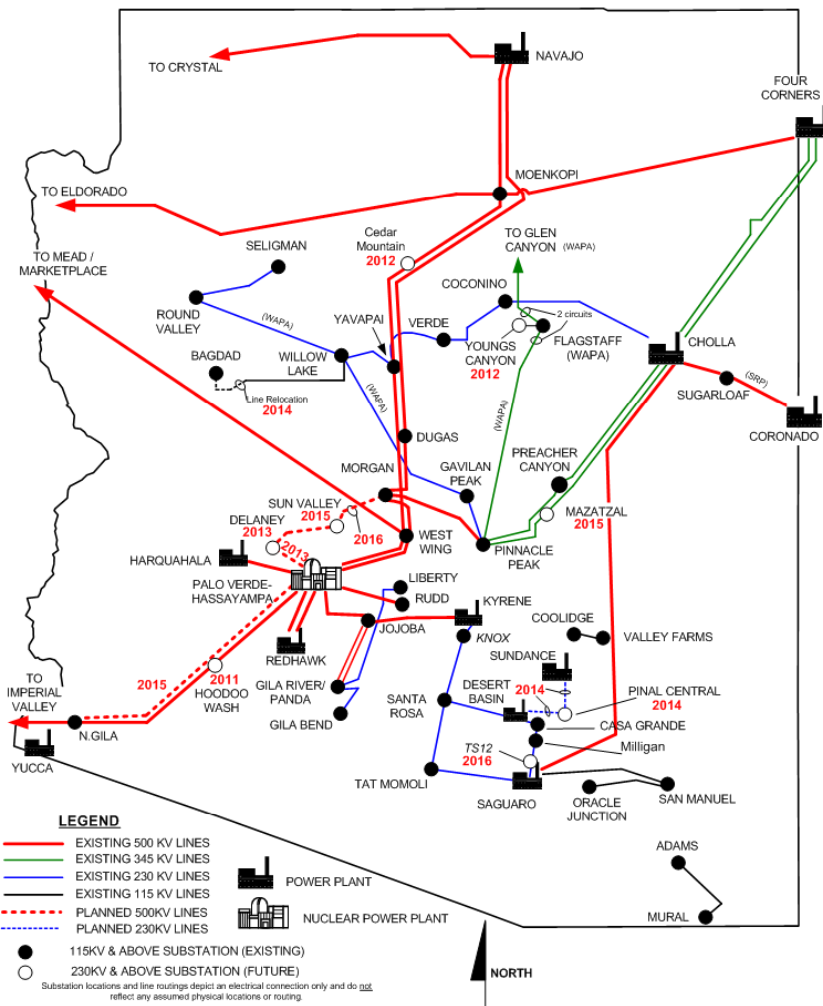
# Arizona Public Service

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- Ten Year Plan Projects
  - ▣ Completed projects
    - Morgan-Pinnacle Peak 500/230kV double-circuit line
  - ▣ New Projects
    - Hoodoo Wash 500kV switchyard
    - Cedar Mountain 500kV switchyard
  - ▣ Deferred projects
    - Delaney-Sun Valley 500kV line – 1 year
    - Sun Valley-Trilby Wash 230kV line – 1 year
    - Hassayampa-North Gila #2 500kV line – 1 year
    - North Gila-TS8 230kV line – 1 year
    - Mazatzal 345/69kV substation – 1 year
    - Scatter Wash 230/69kV substation – 2 years

# Arizona Public Service

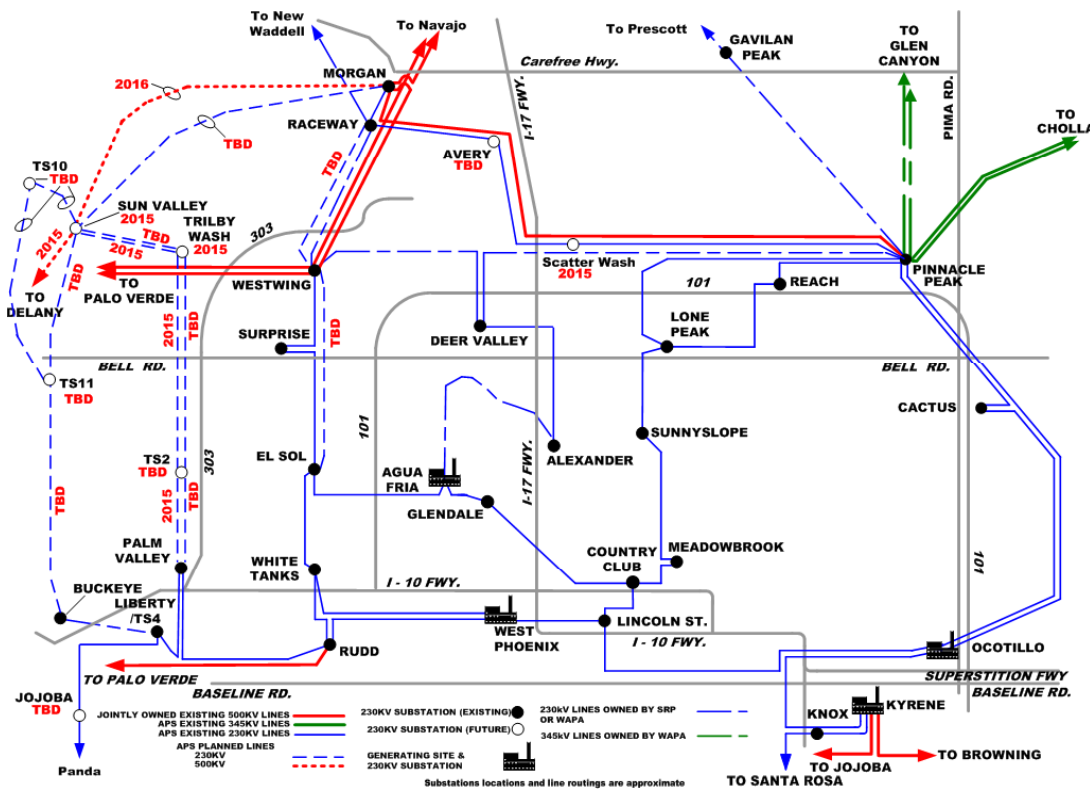
## ***APS EHV & OUTER DIVISION 115/230 KV TRANSMISSION PLANS 2011 - 2020***



- Morgan-Pinnacle Peak 500/230kV double circuit completed
- Hoodoo Wash 500kV switchyard (2011)
- Cedar Mountain 500kV switchyard (2012)
- Youngs Canyon 345/69kV substation (2012)
- Delaney-Palo Verde 500kV line (2013)
- Sundance-Pinal Central-Desert Basin 230kV line (2014)
- Mazatzal 345/69kV substation (2015)
- Delaney-Sun Valley 500kV line (2015)
- Hassayampa-North Gila #2 500kV line (2015)
- TS12 230/69kV substation (2016)
- Morgan-Sun Valley 500kV line (2016)

# Arizona Public Service

**PHOENIX METROPOLITAN AREA TRANSMISSION PLANS 2011-2020**

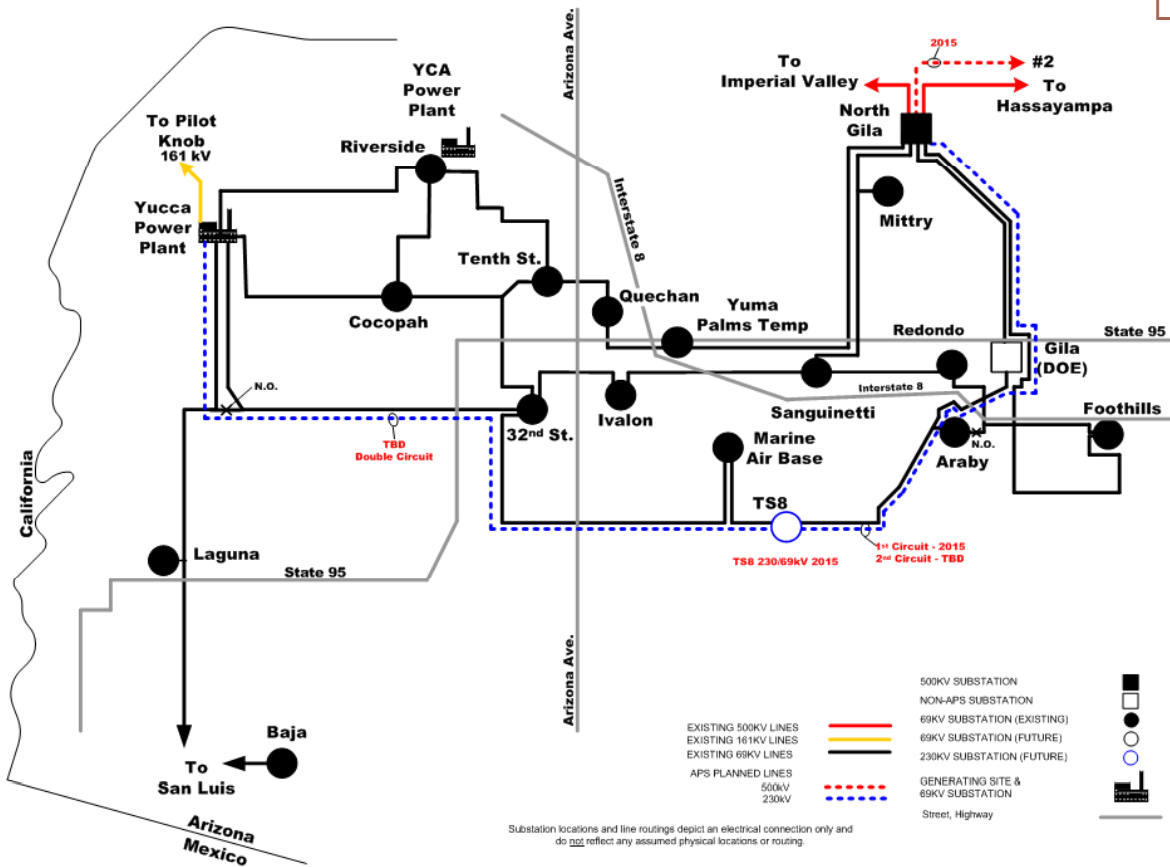


- Morgan-Pinnacle Peak 500/230kV double circuit completed
- Scatter Wash 230/69kV substation (2015)
- Sun Valley-Trilby Wash 230kV line (2015)
- Trilby Wash-Palm Valley 230kV line (2015)

# Arizona Public Service

Yuma Area Transmission Plans 2011- 2020

□ North Gila-TS8 230kV line (2015)



EL PASO ELECTRIC

# El Paso Electric

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## □ Ten Year Plan Projects

### □ Completed projects

- None

### □ New Projects – Re-conductor or Upgrades

- 2012 - Re-conductor Coyote to Caliente 115 kV line
- 2016 - Upgrade Lane 115/69 kV autotransformer to 150 MVA
- 2016 - Re-conductor Americas to Lane 115 kV transmission line
- 2016 - Re-conductor Caliente to Vista 115 kV transmission line
- 2016 - Re-conductor Sol to Vista 115 kV transmission line
- 2016 - Re-conductor Clint to Valley 115 kV transmission line
- 2017 - Re-conductor Ascarate to Padres 69 kV transmission line
- 2017 - Re-conductor Rio Bosque to Padres 69 kV transmission line
- 2019 - Re-conductor Ripley to Thorne 115 kV transmission line
- 2020 - Re-conductor Caliente to Lane 115 kV transmission line.

# El Paso Electric

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## □ Future New Projects

- 2012 - Santa Teresa to Montoya 115 kV line
- 2013 - Improving approximately 4 miles of 115 kV line from the DonaAna-Alamogordo line to White Sands and constructing new Ring Bus on DonaAna to Alamogordo 115 kV line
- 2014 - Add 7.5 MVAR Capacitor Bank to Felipe 69 kV bus.
- 2015 - New Afton 345/115 kV autotransformer, New Afton to Airport 115 kV transmission line, New Airport to Jornada 115 kV transmission line.

## □ Deferred projects

- None

## □ System maps

# El Paso Electric

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## □ NEW GENERATION AND RETIREMENTS

### NEW GENERATION

- RIO GRANDE G9      January 2013
- CC1 G2              January 2015
- CC1 G1              January 2015
- CC1 S1              January 2016
- LMS1                January 2014
- LMS2                January 2019
- CC2 G1              January 2018
- CC2 G2              January 2018
- CC2 S1              January 2018
- NEWMAN6 G2      January 2020
- NEWMAN6 G1      January 2020
- NEWMAN6 S1      January 2020

TOTAL NEW GENERATION = 1045 MW

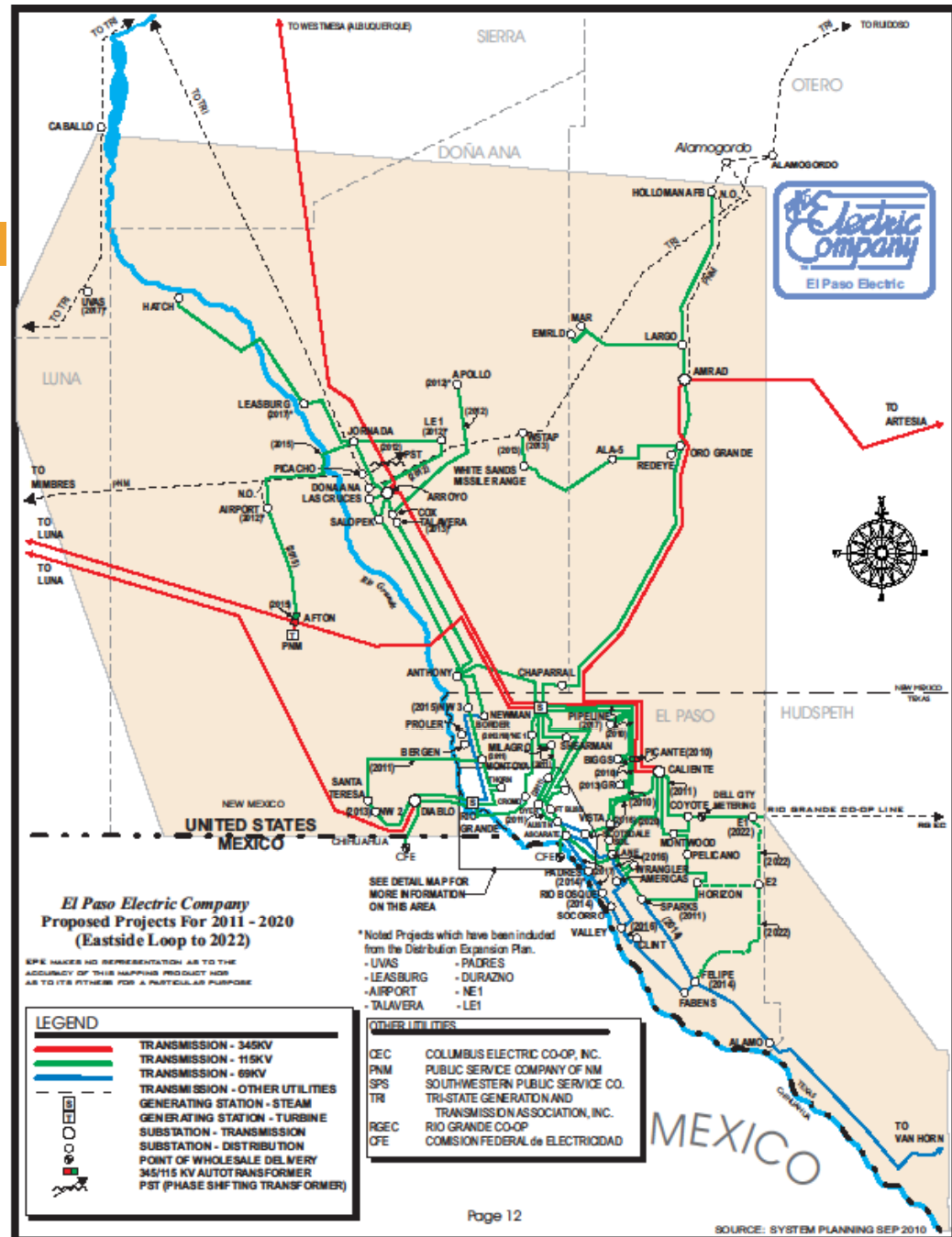
### GENERATION RETIREMENTS

- RIO GRANDE G6      December 2014
- RIO GRANDE G7      December 2017
- NEWMAN G2          December 2015
- NEWMAN G1          December 2019
- NEWMAN4 G1        December 2017
- NEWMAN4 G2        December 2017
- NEWMAN4 S1        December 2017
- NEWMAN G3         December 2019

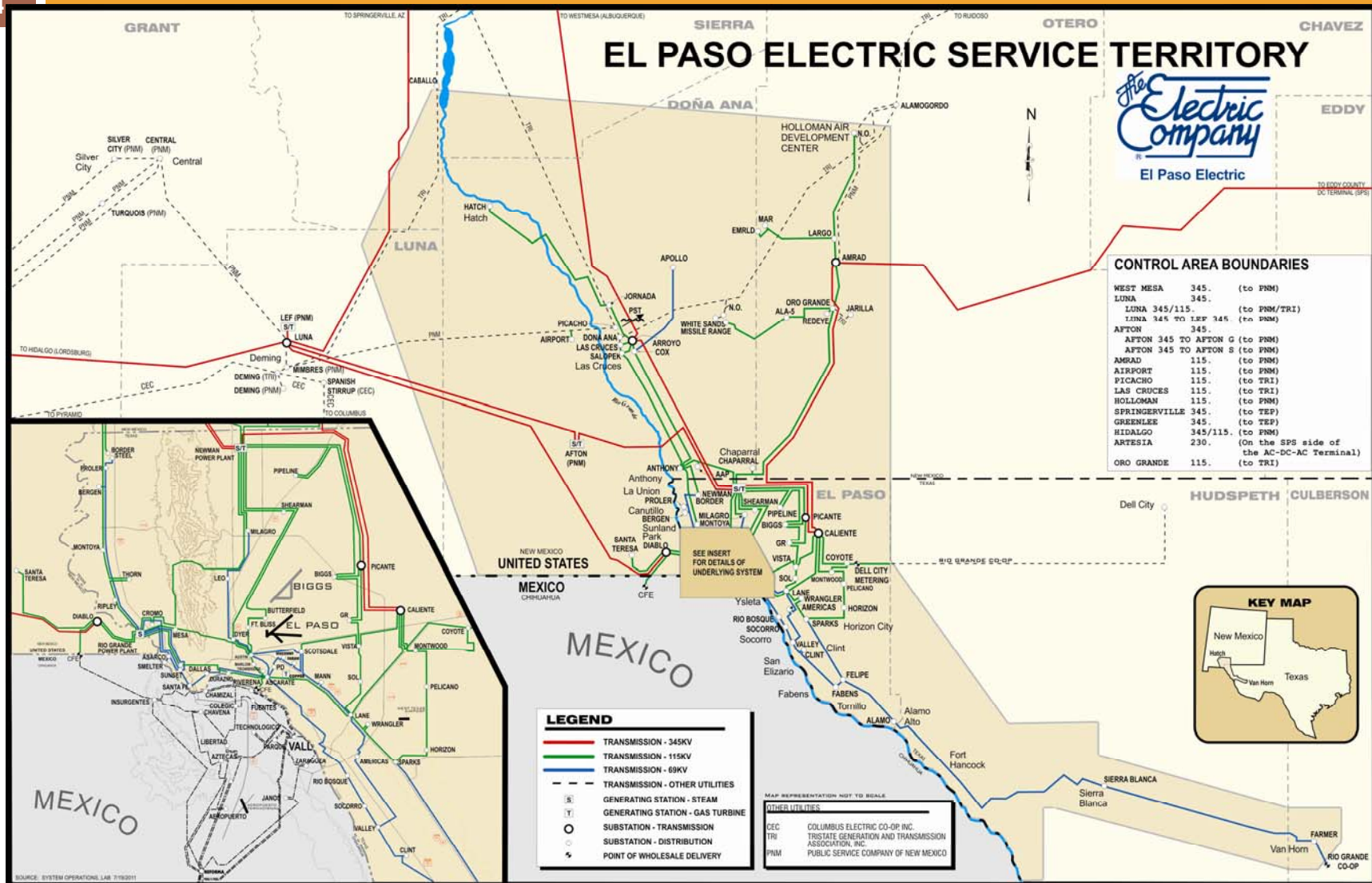
TOTAL RETIREMENT = 573 MW

# El Paso Electric System

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# El Paso Electric



# Imperial Irrigation District

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## □ Ten Year Plan Projects

### □ Completed projects

TL2- 2011 Midway – Bannister 230kV transmission line

(Phase 1):

8.5 - mile single circuit 230 kV Transmission Line (Prepared for double circuit) and 3.5 - mile single circuit 230 kV Transmission Line from IID's Midway Substation to the Salton Sea Area to Interconnect to Geothermal developments.

### □ New Projects

### □ Deferred projects

### □ System maps

# IMPERIAL IRRIGATION DISTRICT



# Imperial Irrigation District

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- ▣ Completed projects

TL2- 2011 Midway – Bannister 230kV transmission line

(Phase 1):

8.5 - mile single circuit 230 kV Transmission Line (Prepared for double circuit) and 3.5 - mile single circuit 230 kV Transmission Line from IID's Midway Substation to the Salton Sea Area to Interconnect to Geothermal developments.

- ▣ New Projects

- ▣ Deferred projects

- ▣ System maps

# Imperial Irrigation District

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## ▣ Ten Year Plan Projects

TL1- 2013 Imperial Valley Substation (IID/SDG&E) to Dixieland Substation (IID) 230kV transmission project.

8.0 – mile single circuit 230 kV Transmission Line (Prepared for double circuit) from Imperial Valley Substation to Dixieland Substation and installation of a 300 MVA, 230/92 kV Transformer at Dixieland Substation.

In service date 2013

TL2- 2013 Coachella Valley –Mirage, Coachella Valley-Ramon and Ramon-Mirage (Path 42) 230kV transmission Line re-conductoring project.

20.0 – mile double circuit 230 kV Transmission Line re-conductoring from single conductor to bundle high temperature conductor.

In service date 2013

# Imperial Irrigation District

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## Development Activities

- TL3- 2013 -2014 Highline Substation to El Centro Switching Station (ECSS) 230kV transmission project.

19.0 – mile double circuit 230 kV Transmission Line from Highline Substation to ECSS and associated Highline substation and ECSS upgrades.

In service date 2013

- TL4- 2013 - 2014 Imperial Valley Substation (IV Sub) to El Centro Switching Station (ECSS) 230 kV transmission project .

18.0 – mile double circuit 230 kV Transmission Line from ECSS to a new Switching Station (IID IV Sub) adjacent to IV Sub and 1/4 - mile double circuit from IID IV Sub to IV Sub and associated ECSS and IV Sub upgrades.

In service date 2013

# Imperial Irrigation District

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## Development Activities

- TL5-2014 North Gila- Highline, 230 kV transmission line

Single circuit 230 kV Transmission Line from North Gila Substation to Highline Substation and associated Highline substation upgrades.

In service date 2013

- TL6-2017 Midway Substation (IID) – Devers Substation (SCE) 500kV transmission line. (Development).

90.0 – mile single circuit 500 kV Transmission Line from IID's Midway Substation to SCE's Devers Substation and associated substation upgrades.

In service date 2017

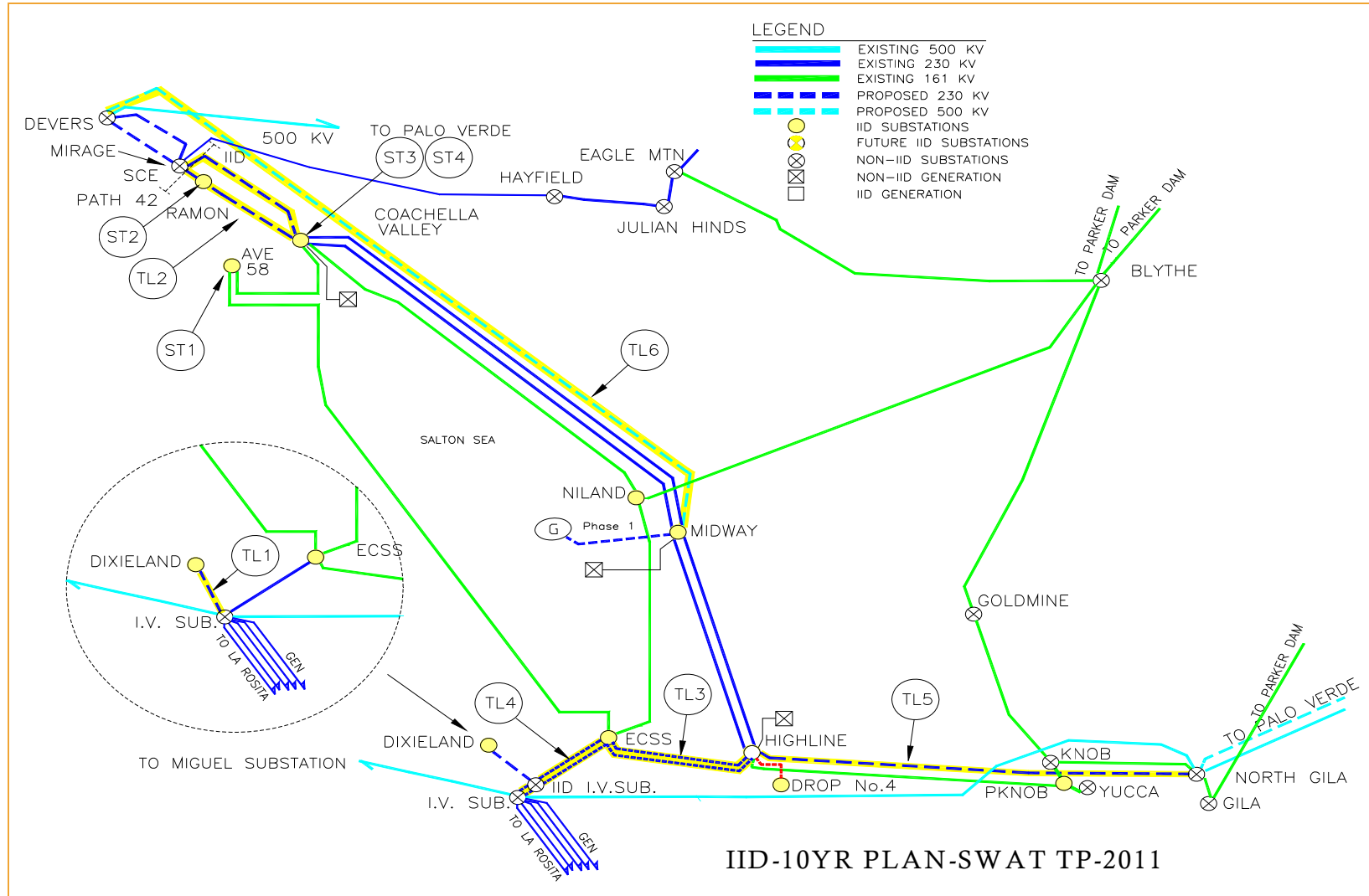
# Imperial Irrigation District

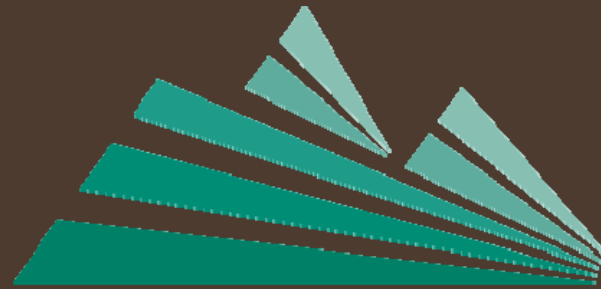
21

## Development Activities

- ST1-2012 Ave 58 Substation, 225 MVA, 161-/92kV transformer addition  
In service date 2012
- ST2-2013 Ramon Substation, 225 MVA, 230-/92kV transformer addition  
In service date 2013
- ST3-2014 Coachella Valley Substation, Bank No 1, 300 MVA, 230/92kV transformer replacement  
In service date 2014
- ST4-2015 Coachella Valley Substation, Bank No. 2, 300 MVA, 230/92kV transformer replacement  
In service date 2015

# Imperial Irrigation District





**NV**Energy™

[nvenergy.com](http://nvenergy.com)

**NV ENERGY**



# NV Energy

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## □ Joint NV Energy/LS On-Line Project

### □ Under Construction

- 235 mile 500kV transmission line Robinson-Harry Allen
- Robinson Summit 500/345 kV substation
- Falcon-Gonder Fold
- Series compensation on the existing Falcon – Gonder 345 kV line
- Harry Allen Terminal

# NV Energy

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## □ Joint NV Energy/LS On-Line Project

- Total Project estimate \$509.6M w/o AFUDC
  - \$14.7M in 2010
  - \$217.6M in 2011
  - \$262.5M in 2012
- In service date December 2012

# NV Energy

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- Consolidation of NV Energy's Northern and Southern Balancing Areas and WECC Path Ratings
  - NVE Request to WECC Planning Coordination Committee and Technical Studies Subcommittee
    - Cancel and remove from the three Phase Rating Process the ON Line rating (currently in Phase II) submitted by NV Energy
    - Initiate a new expedited review process and create a PCRG for the purpose of modifying the existing Path # 81 ("Centennial") rating to comprise the existing southern Nevada interface between NVES and the Eldorado Valley.

# NV Energy ON Line versus Major WECC Paths

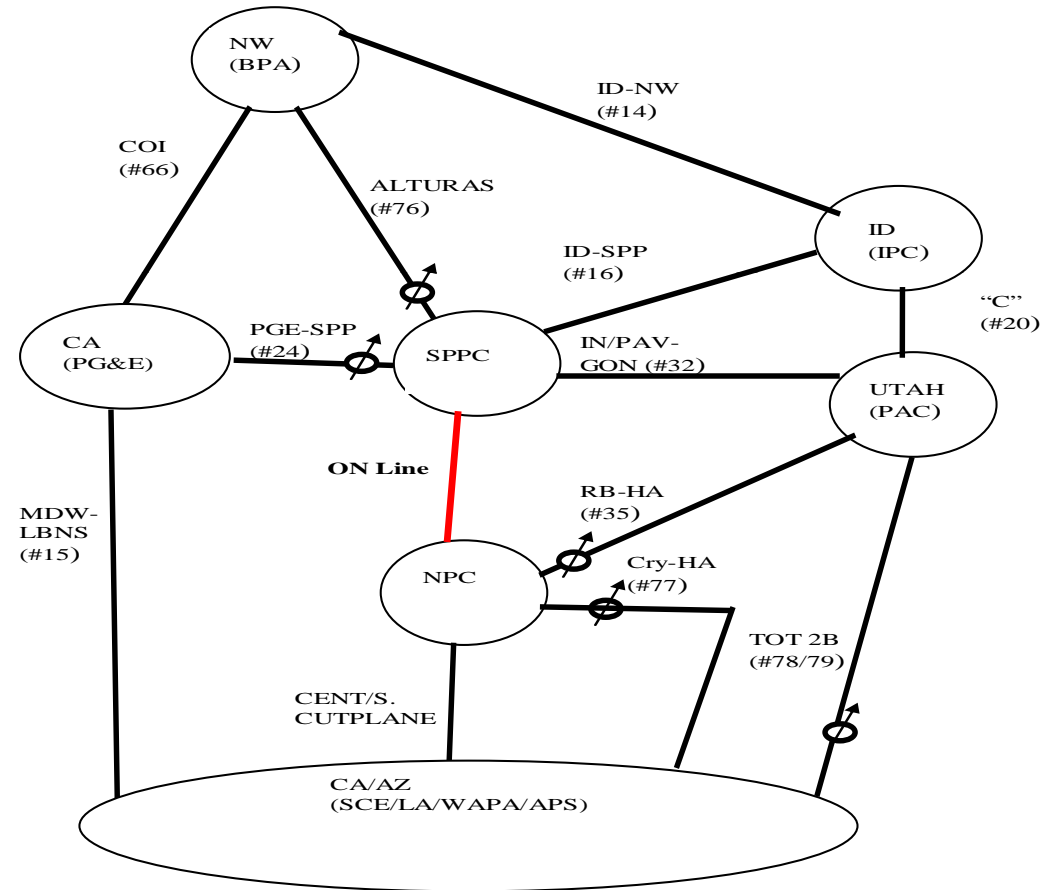


Figure 1: ON Line versus major WECC Paths

# NV Energy

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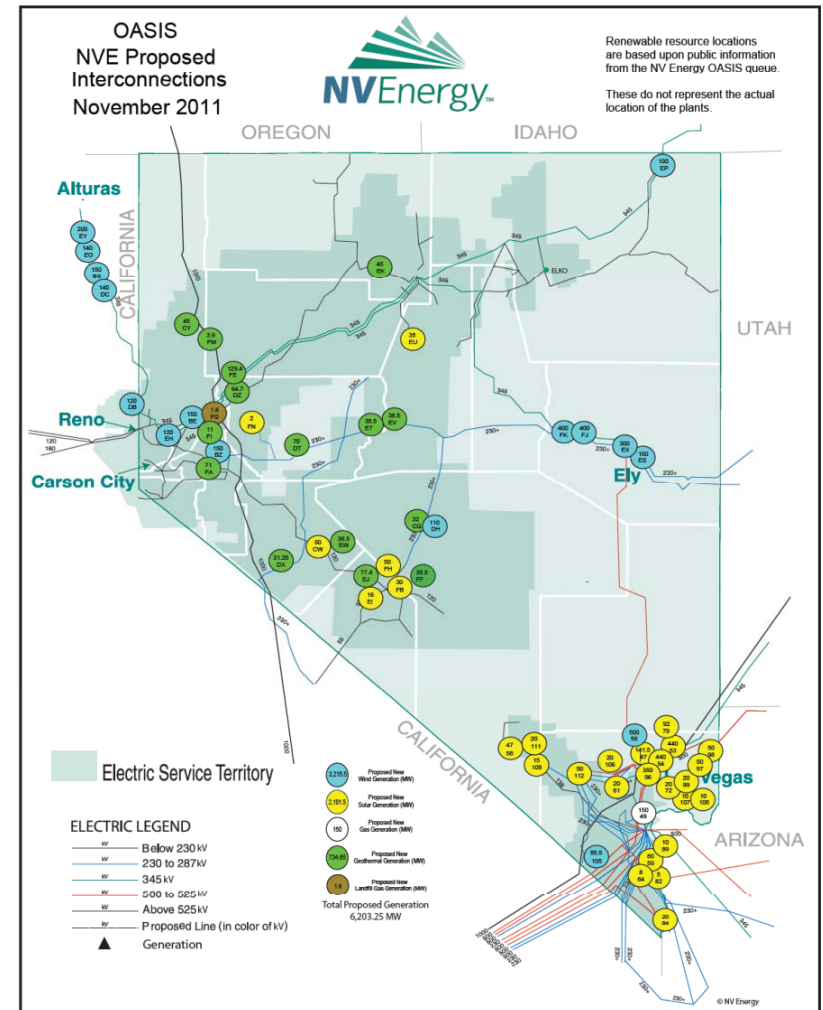
- **Completed & New Transmission Projects**
  - 230kV Shunt Reactors
    - Completed Spring 2011
  - Harry Allen 345/230kV Transformer Bank 2s
    - Completed May 2011
  - Filed as Transmission Corridor Projects (TCP) under WECC Portal
    - Harry Allen – Northwest 500 kV Line Permitting
    - Northwest - Amargosa 500 & 230 kV Permitting
    - Harry Allen – El Dorado 500 kV Line Permitting

# NV Energy

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## Renewable Energy Transmission

- Offered under a Pro Forma OATT
- Interconnection requests ~6,200 MW of requests in queue
  - Transmission Service Requests Network and Point-to-Point
- FERC and NERC Compliance
- Balancing and System Control Operations Regional Coordination WECC, WestConnect, others

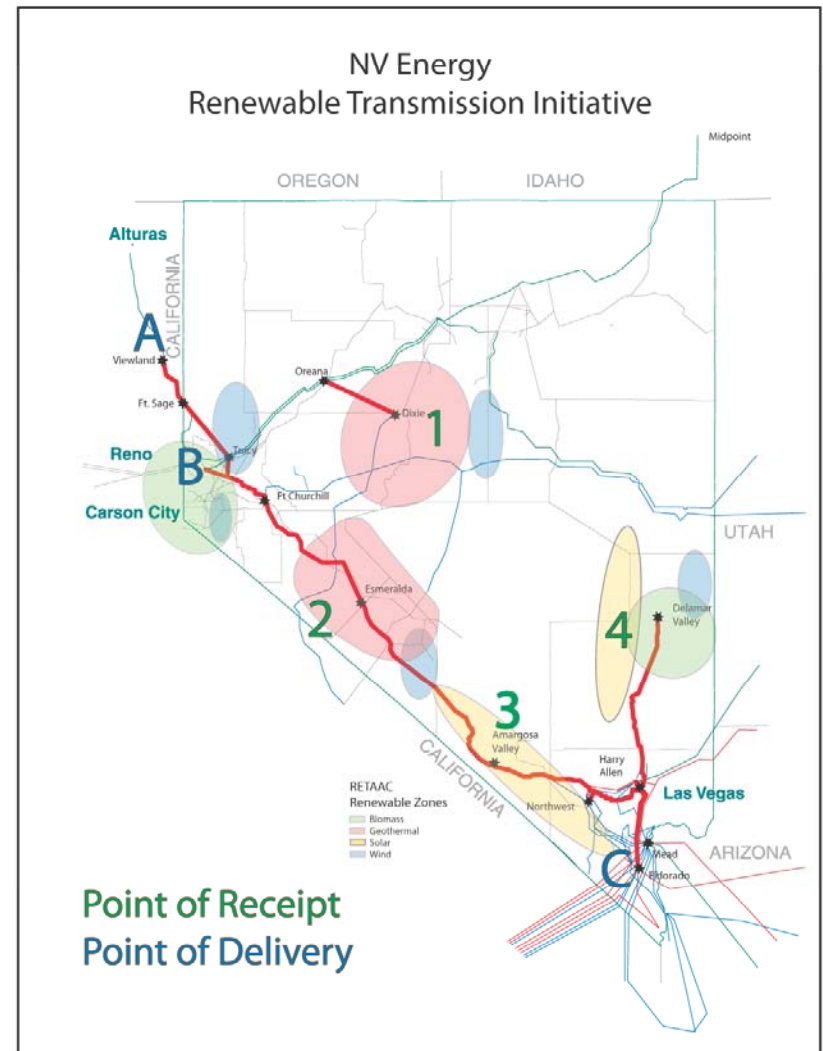


# NV Energy

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## □ Renewable Energy Transmission

- Transmission proposed from four Points of Receipt (1-4) to three Points of Delivery (A-C)
- ~ 600 miles of potential EHV lines
- Significant response on Sept. 16th, 2011
- Study agreements sent Nov. 1st, 2011
- Agreements due by Dec. 15th, 2011



PUBLIC SERVICE COMPANY  
OF NEW MEXICO



# Public Service Company of New Mexico

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## □ Completed Projects

### □ Alamogordo Third Source

- Provides a third 115 kV transmission source into Alamogordo station by interconnecting a 115 kV transmission line to EPE's Holloman station.

### □ Rio Puerco Phase 1

- Installation of a 345/115 kV transformer on the BA-West Mesa 345 kV line to meet service requirements of the Rio Rancho area.

### □ Mimbres Shunt Capacitor Addition

- Installation of two 15 Mvar capacitors to maintain acceptable voltage in the Deming area.

### □ Yah-Ta-Hey Additional Capacitors Phase 1

- Installation of one 25 Mvar capacitor at Yah-Ta-Hey station to provide voltage support for the Gallup area

### □ Red Mesa 115 kV Switching Station

- Construction of a 115 kV switching station for the interconnection of the Red Mesa Wind Farm

# Public Service Company of New Mexico

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- New Projects
  - None

# Public Service Company of New Mexico

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## □ Deferred Projects

### □ 2012

- Alamogordo Voltage Support Phase 1 (Installation of two switchable shunt capacitors at the Alamogordo 115 kV station for additional voltage support) – Phase II delayed until 2015

### □ 2013

- Moriarty Capacitors

### □ 2014

- Rio Puerco Phase 2
- Ojo 345/115 kV Transformer replacement
- Sandia-North 115 kV Line
- Sandia 115 kV Capacitor Addition

### □ 2015

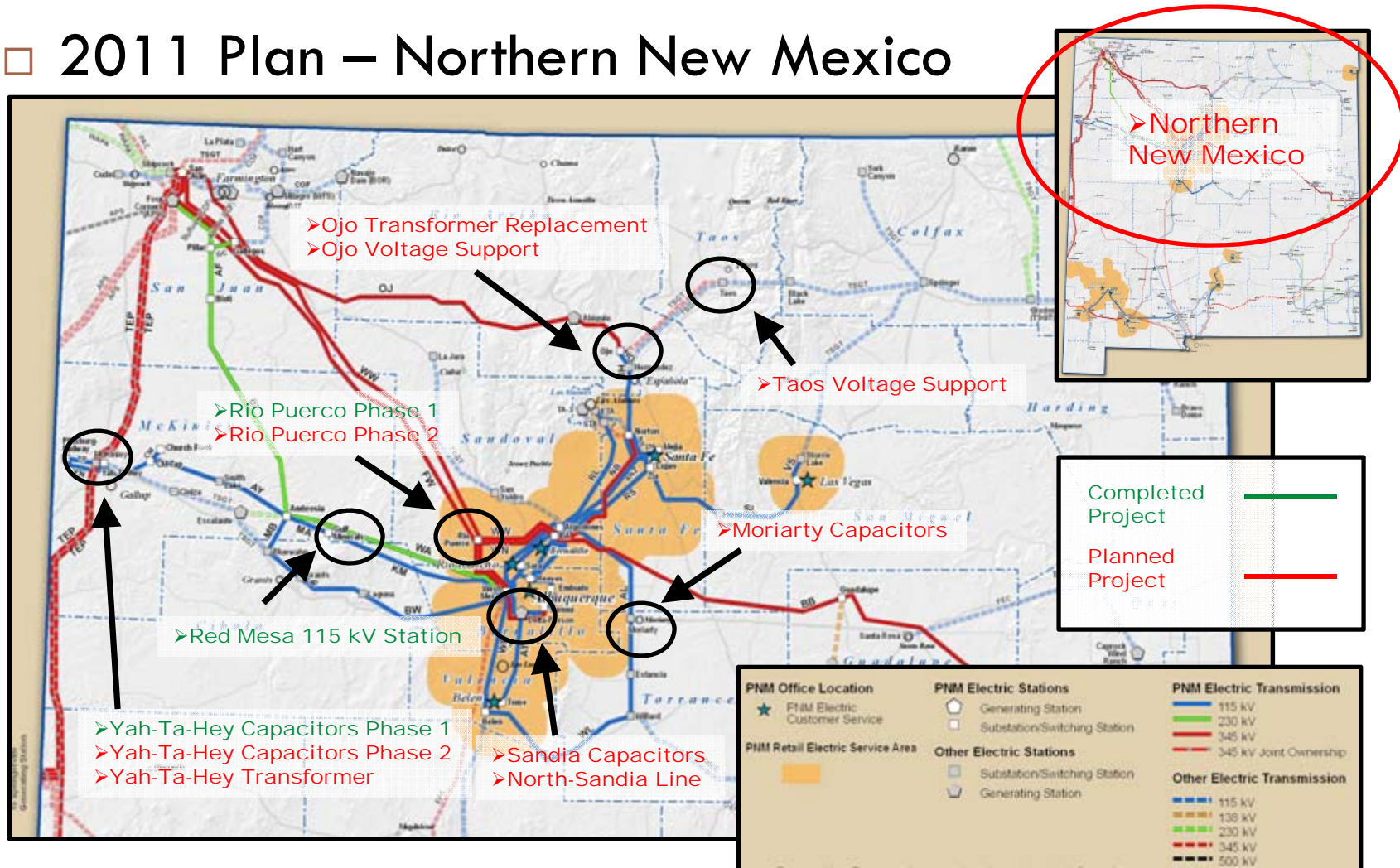
- Yah-Ta-Hey Second Transformer
- Alamogordo Voltage Support Phase 2 (Installation of dynamic voltage support at the Alamogordo 115 kV station)

### □ 2016+

- Ojo Voltage Support

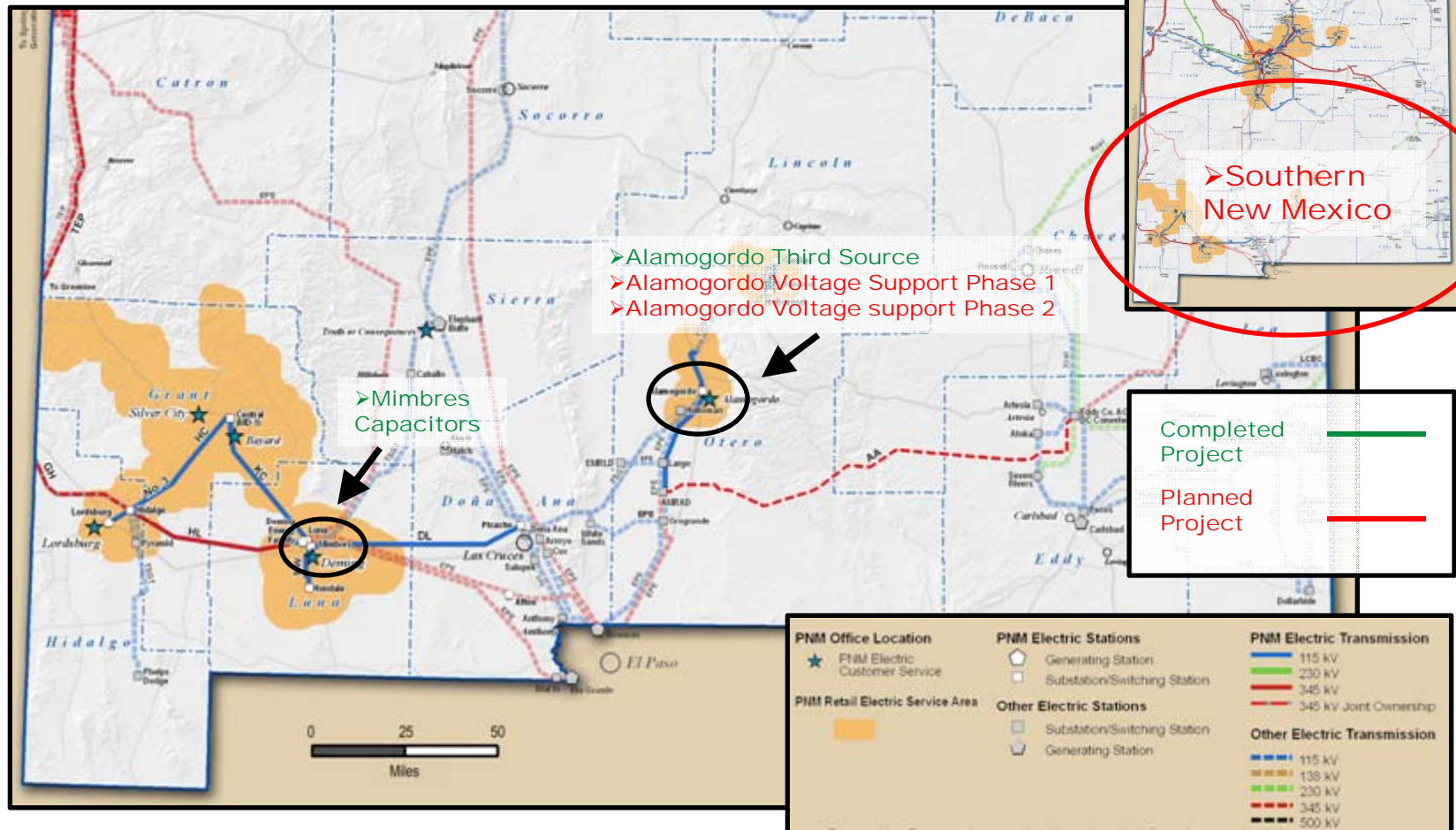
# Public Service Company of New Mexico

## 2011 Plan – Northern New Mexico



# Public Service Company of New Mexico

## 2011 Plan – Southern New Mexico



# SALT RIVER PROJECT

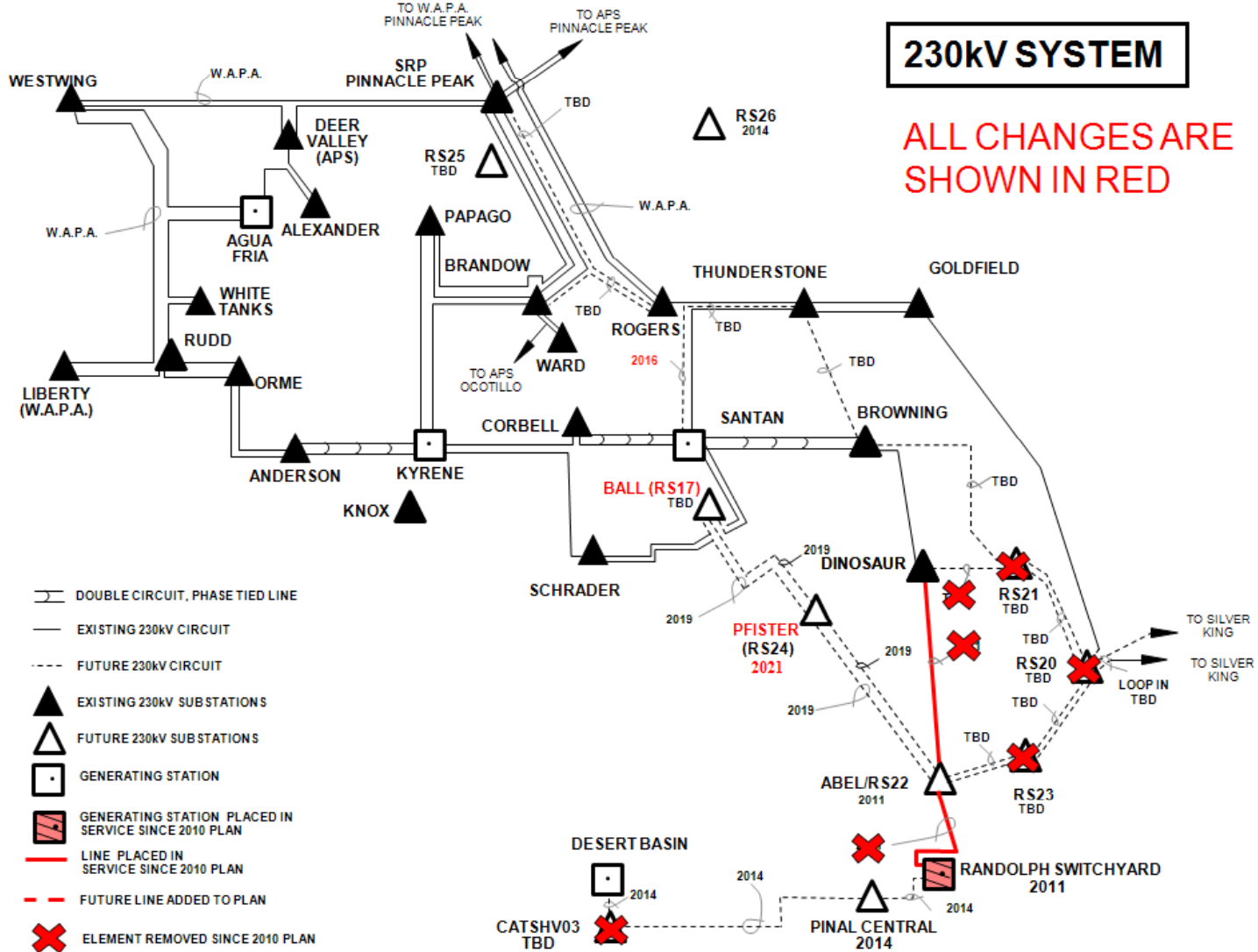


# Salt River Project

- Ten Year Plan Projects
  - Completed projects
    - Dinosaur-Abel-Randolph 230kV line
    - Abel 230kV yard and 230/69kV transformer
    - Randolph 230kV yard
    - Morgan-Pinnacle Peak 500kV line
  - New Projects
    - Multiple Eastern Mining Area Projects – See Map
    - East Valley Industrial Expansion (not yet shown on map as route has to be determined)
  - Deferred projects
    - Pfister 230kV Substation was 2019, now 2021
    - SunZia Southwest Transmission Project was 2015/2016, now 2016
    - Rudd 230/69kV was 2014, now 2018
    - Schrader 230/69kV was 2014, now 2013
  - Advanced Project
    - Rogers-Santan was TBD, now 2016



# Salt River Project

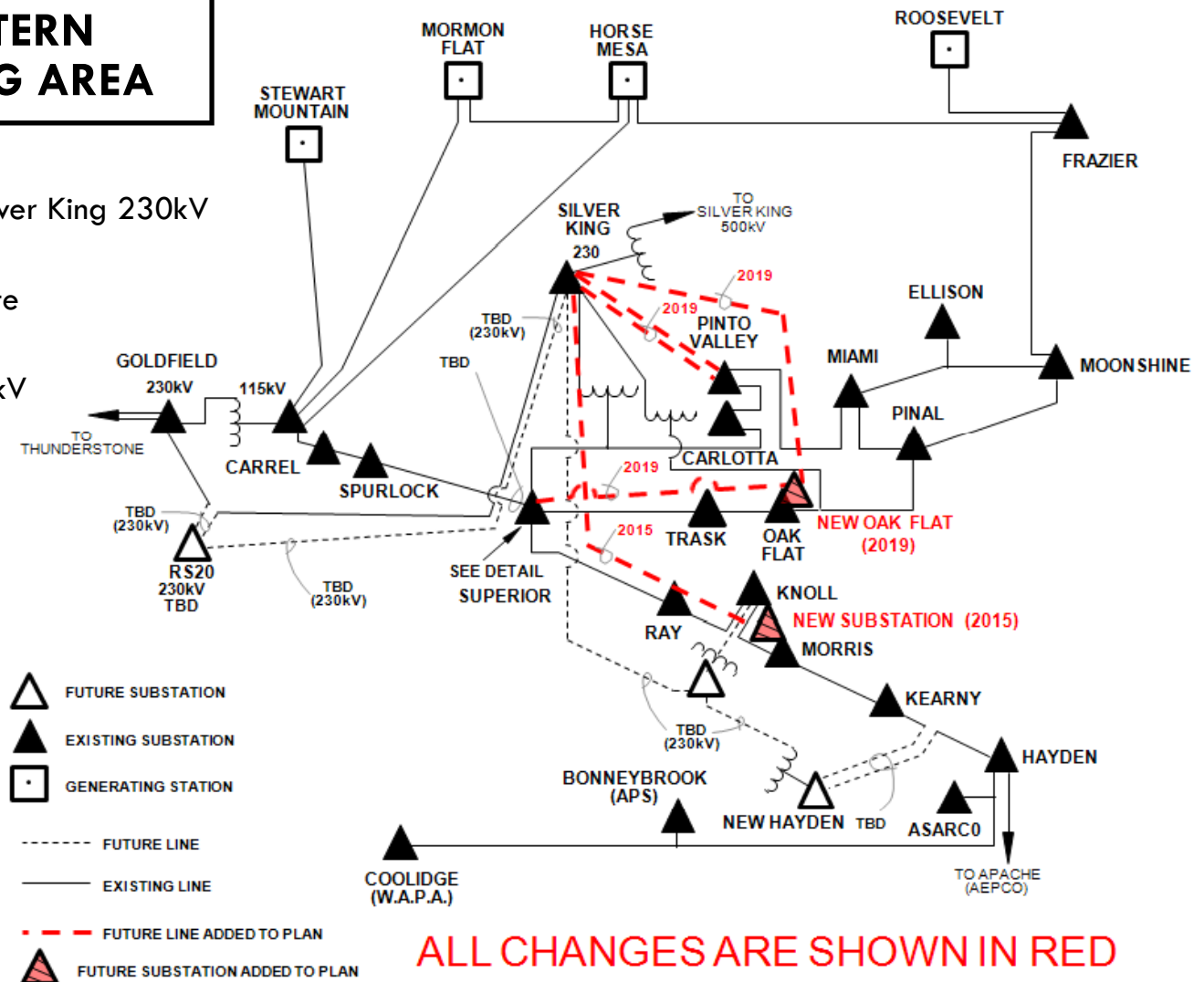
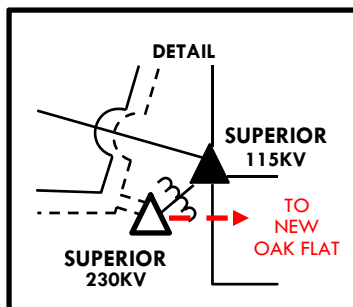


# Salt River Project

## EASTERN MINING AREA

### New Projects

- New Superior – New Oak Flat – Silver King 230kV
- Superior – Silver King 115kV re-route
- Silver King – New Pinto Valley 230kV
- Eastern Mining Expansion 230kV



# SOUTHWEST TRANSMISSION COOPERATIVE



# Southwest Transmission Cooperative



## □ Ten Year Plan Projects

### □ Completed projects

- The Pantano to Sahuarita 230 kV Line Loop-in to New Tucson Project went into service in 2011.

### □ New Projects

- Two new projects are proposed for the 2012-2021 time frame and are currently under study:
  - Saguaro to Rattlesnake 115 kV Line-loop into Marana. This project is a reconfiguration of the Marana Tap to Marana 115 kV Line Upgrade Project. The projected in-service date will be either late 2012 or early 2013.
  - Three Points to Bicknell 115 kV Line Upgrade in 2020.

# Southwest Transmission Cooperative



- Ten Year Plan Projects

- Deferred projects

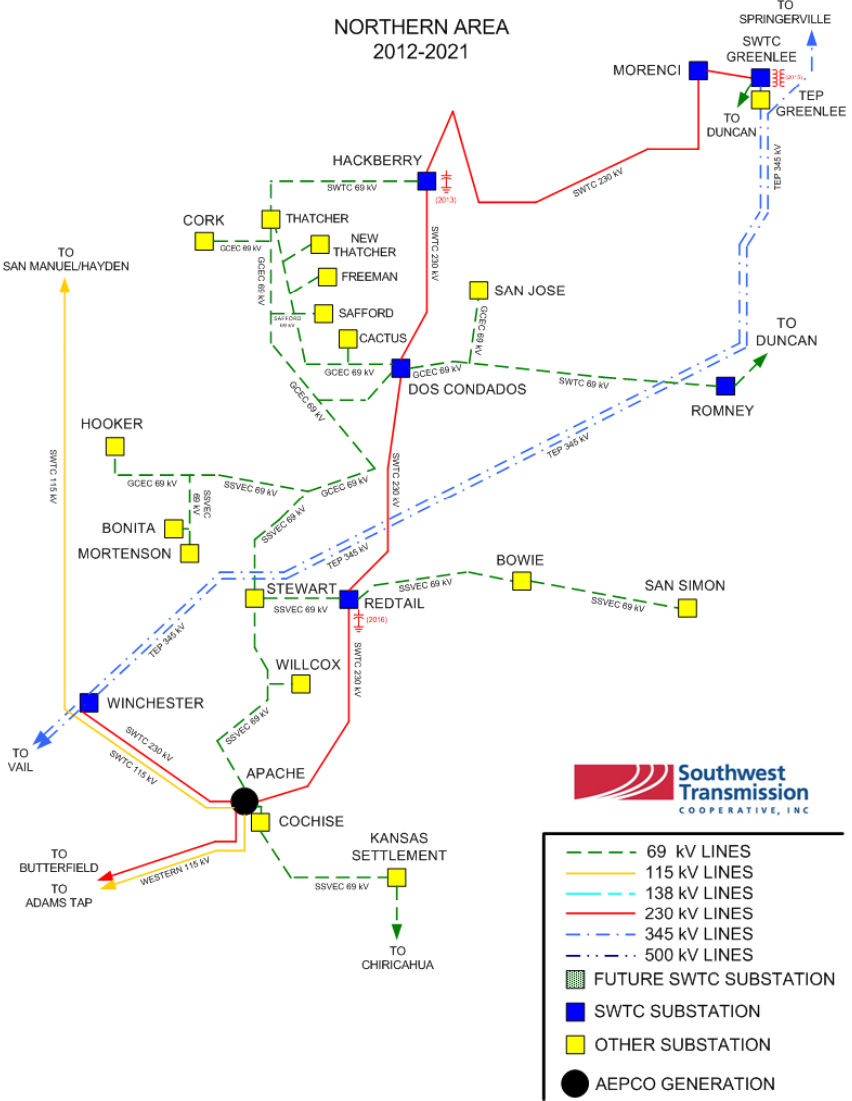
- The Apache/Hayden to San Manuel 115 kV Line has been deferred from 2014 to 2017.

- System maps

- See next 3 slides:

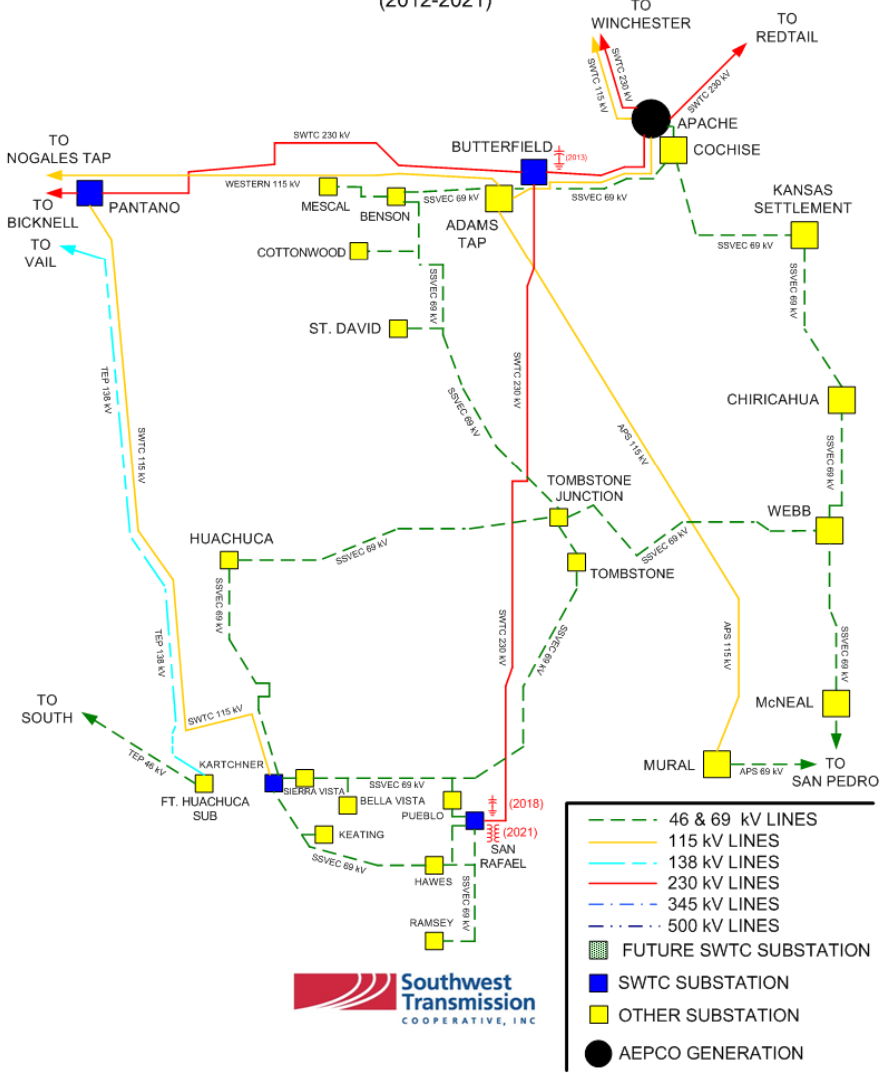
- SWTC Northern Area Map
      - SWTC Southern Area Map
      - SWTC Western Area Map

# SWTC Northern Area Map



# SWTC Southern Area Map

SOUTHERN AREA  
(2012-2021)





# TUCSON ELECTRIC POWER COMPANY

# Tucson Electric Power



## □ Ten Year Plan Projects

### ▣ Completed projects

- Tortolita – North Loop 138 kV Quad Circuit
- Tortolita 500/138kV Transformer #3
- Canoa Ranch 138kV Substation

### ▣ New Projects

- Naranja – LaCanada 138kV Transmission Line Project (2017)
- *Reconfigure* Tortolita – Rancho Vistoso → North Loop – Rancho Vistoso (2015)

# Tucson Electric Power

## ■ Unchanged Projects

- Vail 345/138kV Transformer #3 (2012)
- DMP- Tucson 138kV Line (2013)
- Craycroft Barril 138kV Substation (2013)
- Harrison 138kV Substation (2013)
- Hartt 138kV Substation (2013)
- Series Capacitor Replacement at Vail 345kV Substation (SP-VL) (2013)
- Duval CLEAR 138kV Switchyard (2014)
- Canoa Ranch – Duval CLEAR 138kV Circuit Extension (2014)
- Orange Grove 138 KV Substation (2014)
- Pinal Central – Tortolita 500kV Project (2014)
- Tortolita 500kV Switchyard (2014)
- Series Capacitor Replacement at Vail 345kV Substation (WN-VL) (2015)
- Anklam 138kV Substation (2016)
- Kino 138 KV Substation (2017)
- East Ina 138 KV Substation (2017)
- Irvington – Tucson 138kV Transmission Line #2 (2017)
- Orange Grove – East Ina 138kV Transmission Line (2017)
- Medina 138kV Substation (2018)

# Tucson Electric Power

## ■ Deferred projects

- Corona 138kV Substation– 1 year (2017)
- Raytheon 138kV Substation– 1 year (2020)
- UA Med 138 kV Substation – 1 year (2020)
- Rosemont 138kV Transmission Line – 1 year (2013)
- Willow 345kV Substation – (1) year (2016)
- North Loop 138 kV Yard Reconfiguration (PH2 & PH3) – (1-2) years (2013-2014)
- Marana 138kV Substation– 2 years (2017)
- University of Arizona Tech Park 138 Substation– 2 years (2017)
- Vail – Valencia 115kV to 138kV Conversion– 2 years (2014)
- Naranja 138kV Substation– 4 years (2020\*)

## ■ Downgraded Projects (Planned → Conceptual)

- North Loop – Rillito 138kV Line Reconductor
- Irvington – 22<sup>nd</sup> St. 138kV Line Reconductor
- Irvington – Tech Park – Vail 138kV Line Reconductor
- North Loop – DMP 138kV Line Reconductor
- Rancho Vistoso – La Canada 138kV Line Reconductor
- Los Reales – Vail 138kV Line Reconductor
- Los Reales – Pantano 138kV Line Reconductor

WESTERN AREA POWER  
ADMINISTRATION - DESERT  
SOUTHWEST REGION

Presented by: Joshua Johnston

# WAPA-DSW Completed Projects

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- Davis Stage 05—New 69-kV substation energized with two new 230/69 transformers functional.
- Liberty Substation 345/230-kV 600 MVA replacement transformer ordered.
- Rebuild of Thornton Road - Empire - ED5 - ED4 to 230-kV will be completed in the next two years.
- Limited appropriated funding in FY10 severely limited FY11 projects.

# WAPA-DSW New Projects

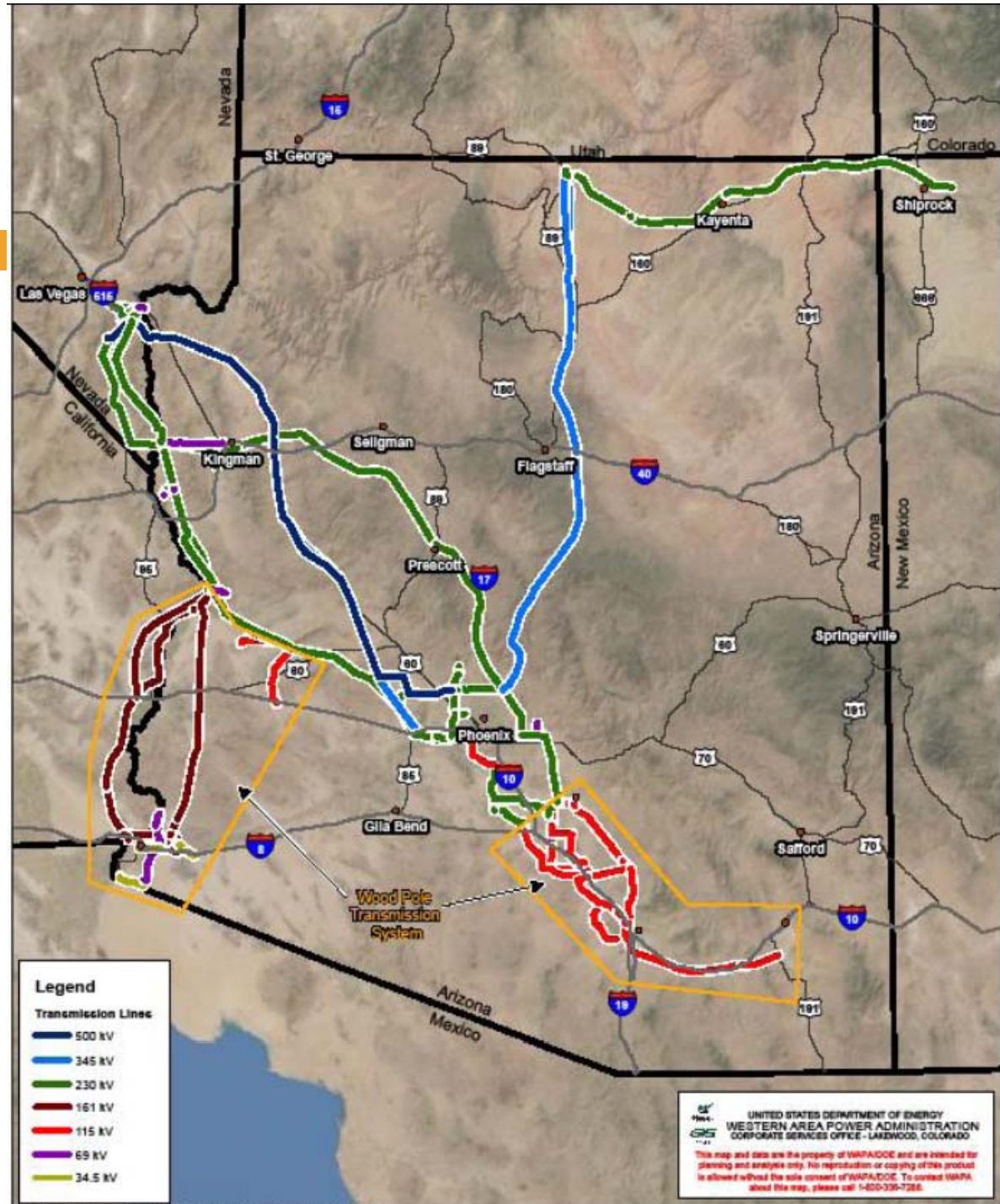
54

- Coolidge Substation will have new 230/69-kV transformer added.
- 230/138-kV Transformer is being added to Glen Canyon to provide backup load support.
- ED2-ED4 transmission line rebuild project will be proposed for customer vote.

# WAPA-DSW Deferred Projects

- 115-kV wood pole transmission line south of Phoenix to Apache is still a priority. Rebuilt as 230-kV on steel as funding becomes available.
- 230-kV wood pole transmission line south of Parker Dam is still a priority. Rebuilt as 230-kV on steel as funding becomes available.

# Wood Pole Transmission Lines



CONTACTS & UPCOMING  
OPEN (ORDER 890)  
STAKEHOLDER MEETINGS

# SWAT Utilities - Contacts

58

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- Western Area Power Administration – Desert Southwest
  - Joshua Johnston:  
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# SWAT Utilities – Order 890 Meetings

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- Arizona Public Service
  - December 16, 2011
  - Location: Phoenix, AZ
  
- Public Service Company of New Mexico
  - November 3, 2011
  - Location: PNM Downtown Offices, Albuquerque, NM
  
- Salt River Project
  - December 16, 2011
  - Location: Phoenix, AZ
  
- Southwest Transmission Cooperative
  - December 6, 2011
  - Location: Tucson, AZ
  
- Tucson Electric Power Company
  - December 6, 2011
  - Location: Tucson, AZ
  
- Western Area Power Administration – Desert Southwest
  - December 13, 2011
  - Location: Phoenix, AZ