INDEPENDENT
ENERGY
PRODUCERS
ASSOCIATION

October 22, 2013

Comments of the Independent Energy Producers Association
Staff Report: Initial Statement of Reasons For Rulemaking
Amendments to the Regulation for the Mandatory
Reporting Of Greenhouse Gas Emissions
Released September 4, 2013

The Independent Energy Producers Association (IEP) appreciates the opportunity to comment on CARB's Staff Report: Initial Statement of Reasons regarding the Amendments to the Regulation For The Mandatory Reporting of Greenhouse Gas Emissions, released September 4, 2013. IEP's comments speak primarily to CARB's use of the default emissions factor for imputing emissions to unspecified system power. In addition, IEP addresses CARB's proposal to impose a "system rate" for system power suppliers whose system emissions are above the default rate. IEP's comments stem from the longstanding concern that the default emission factor has been set at an artificially low level, thereby creating a disadvantage between in-state generation resources that are regulated directly out of the stack and entities that are importing power at the low default rate not representative of their actual emissions.

Specifically, IEP's comments address the following:

1. CARB's proposal to calculate a separate "system emission factor" for power suppliers whose system emissions from their portfolio of resources exceed the default rate is appropriate.
2. Power suppliers' unique system emission factors should accurately represent the emissions associated with the power that is delivered to California.
3. CARB should update the proposed system emissions factors on a regular basis to ensure the greatest accuracy of reported data.

Evidence Suggests That the Existing Default Emissions Factor Does Not Accurately Represent the Carbon Content of Power that is Imported Into California. IEP recently commissioned an analysis to determine whether the emissions rate associated with power imported into California from a power suppliers particular system may indeed be higher than the existing default rate applied to unspecified imports. See attached. The results of this analysis suggest this is the case.

The attached analysis uses generation resources owned by Arizona Public Service Company (APS) and resources in the APS Power Control Area to compute a set of emissions factors to represent the emissions associated with power from the APS system, under various generation scenarios. In May 2013, APS established a policy that all generation exported to California will be labeled as "system" power.[1] The analysis indicates that the range of APS

[1] See APS letter dated May 8, 2013 (attached).

1215 K Street • Suite 900 • Sacramento, CA 95814 • office: 916-448-9499 • fax: 916-448-0182 • email: iep@iepa.com

specific system emission rates varies depending on which generation resources are included in the calculation. For example, one of the scenarios includes all of the generation (and associated emissions) owned by APS to calculate an emissions rate, while other scenarios may exclude renewable generation and/or nuclear generation from the calculation. APS was chosen as a point of reference due to its close proximity to California and the likelihood that power from the APS "system" will indeed be imported into California.

The analysis, which resulted in a range of emission factors for the combined resources owned by APS in both 2009 and 2012, concludes that the emissions rate associated with the power delivered to California from the APS system range from 0.5086 metric tons of carbon dioxide equivalent per megawatt hour ($MTCO_2e/MWh$) on the low end to 0.7196 $MTCO_2e/MWh$ on the high end, depending on the generation scenario.[2] On the low end, the APS-specific emission factor is nearly 16% higher than CARB's default rate. In all cases the emission rates for the APS system exceed the level of CARB's default rate. On the high end, the APS-specific emissions factor is 40% higher than CARB's existing default emissions rate of $0.428MTCO_2e/MWh$.

In addition, as noted in the attached analysis, the U.S. Environmental Protection Agency's Emissions and Generation Resource Integrated Database (eGRID) provides 2009 net generation and annual CO_2 equivalent emissions data for which an emission factor can be calculated for the entire APS Power Control Area (i.e. power in the APS control area, but not necessarily owned by APS). This data yields an emission rate for the APS Power Control Area of 0.8448 $MTCO_2e/MWh$; nearly double CARB's default rate that is currently applied to unspecified imports.[3] To put this in perspective, first deliverers importing system power into California are essentially paying about half of the GHG compliance costs that they would be required to pay if a system rate, based on the APS Power Control Area numbers from the eGRID, were employed.

CARB's Proposal to Calculate A Specific System Rate for System Power Suppliers that are Above the Default Rate Is Appropriate. In order to more accurately reflect the carbon content of power that is imported into California, CARB proposes to "require purchasers of system power that has a carbon content above the default emission factor to report imported power using a system power emission factor calculated by ARB, instead of the lower default emission factor for unspecified power, in order to accurately reflect the carbon content of the system power."[4] IEP supports this proposal.

As noted by CARB, "Some power systems outside California do not tag power at the generation facility or unit level but instead tag power as system power at the system level to reflect the combined output of its generation portfolio."[5] As a result, the existing default

---

[2] See Attachment: Atkins Greenhouse Gas Emissions Assessment of Imported Power, page 5.
[3] See Attachment: Atkins Greenhouse Gas Emissions Assessment of Imported Power, page 6.
[4] Staff Report: Initial Statement of Reasons For Rulemaking Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, page 5.
[5] Staff Report: Initial Statement of Reasons For Rulemaking Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions, page 60, 61.

emissions factor of 0.428MTCO2e/MWh does not accurately represent the GHG emission profile of power coming into California from a particular system. Accordingly, a system specific emission factor should be calculated for these resources and applied when it exceeds the default rate.

How CARB Calculates The System Rate Is Important. The method by which CARB calculates the "system rate" for an individual power supplier exporting into California is important. CARB's proposal to use the "weighted average power output from all generation resources under the ownership or control of the system power supplier which contributes to the power output mix" will likely be on the conservative side given that it will calculate a rate using the output from ***all*** generation resources, including renewables and nuclear generation with zero emissions.[6] Given that low or zero emitting generation resources (i.e. renewables and nuclear generation) are likely serving the customers/constituency in the territory in which the power is created due to the co-benefits associated with these types of generation resources, it is likely that California is indeed receiving power with emission factors in the upper bounds of the rates that were calculated.

CARB Should Ensure that GHG Emissions Reporting is Transparent, Accurate and Does Not Foster Leakage and/or Contract Shuffling. In-state generators subject to CARB's cap-and-trade program are directly reporting emissions, and they have corresponding compliance obligations for the metric tons of CO_2e that they emit. Consequently, using a default emissions factor that does not accurately represent the GHG content of the power that is imported into California creates a clear incentive for a portfolio of relatively high emitting base load resources to categorize its whole portfolio as unspecified in order to obtain a competitive advantage by avoiding its full carbon allowance obligation. This raises questions regarding the fair treatment of in-state vs. out-of-state generation as well as the integrity of the cap and trade program in general.

Accordingly, IEP appreciates CARB's attempt to correct these protocols by calculating a specific emission factor for system power sources whose emissions rate exceeds the default rate. CARB must structure the default emissions factor and system specific emissions factors such that in-state and out-of-state entities face similar standards in terms of GHG compliance obligations; otherwise, in-state generators are at an extreme disadvantage in comparison to their out-of-state competitors.

CARB Should Regularly Update the System Specific Emission Factors for System Power Suppliers. As the attached analysis indicates, power generation fluctuates, new plants open, old plants retire, changes in ownership occur, etc. Accordingly, the emissions factors associated with system power suppliers will need to be updated regularly. Updating these emission factors on a regular basis will give CARB an accurate account of the GHG emissions that are really associated with power that is imported into California. Further, this will allow the CARB to accurately assess the states' progress in achieving the AB 32 goals.

---

[6] Appendix A: Proposed Regulation Order, Section 95102(a)(451), page 19.

IEP still contends the most accurate way for CARB to account for the GHG emissions associated with imported power is to incentivize the reporting of specified power. IEP has suggested, in the past, that CARB set the default emission factor sufficiently high (i.e. equivalent to the emissions of a coal facility) in order to create an incentive for entities to specify. Under this model, CARB could presume that all resources that remain unspecified are indeed associated with an emissions rate equal to a coal-fired facility.

Remaining Questions Related to Identifying System Power Suppliers. IEP supports CARB's proposal to reconsider the emissions rates of imports delivered into California that are not accurately represented by the default emissions factor. More transparency and accuracy is always better. However, CARB's proposal still leaves a few unanswered questions for stakeholders to consider, including the following:

1. How will CARB choose which entities will be considered "system power suppliers"?
2. How will CARB decide when to calculate a system specific emission factor?

IEP appreciates the opportunity to comment on the Staff Report: Initial Statement of Reasons For Rulemaking Amendments to the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

Respectfully Submitted,

Steven Kelly
Policy Director
Independent Energy Producers Association
1215 K Street, Suite 900
Sacramento, CA 95814
(916) 448-9499
steven@iepa.com

Amber Riesenhuber
Policy Analyst
Independent Energy Producers Association
1215 K Street, Suite 900
Sacramento, CA 95814
(916) 448-9499
amber@iepa.com

Attachment 1

ATKINS

Greenhouse Gas Emissions Assessment of Imported Power

Summary

This study uses publicly-available data to develop a set of emission rates for a non-California entity under a variety of generation scenarios, for comparison with the California Air Resources Board's (ARB) default emission factor for unspecified electricity imports of 0.428 metric tons of carbon dioxide equivalent per megawatt hour ($MTCO_2e/MWh$) under the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions. Arizona Public Service Company (APS) was used as a point of comparison because of the utility's proximity to California and connectivity within the electric grid. The emissions assessment of APS's generation scenarios used data from the U.S. Environmental Protection Agency's (EPA) Emissions & Generation Resource Integrated Database (eGRID), with adjustments to calculations based on APS's 2012 Integrated Resource Plan, and resulted in a range of six emission factors ranging from 0.5086 $MTCO_2e/MWh$ to 0.7196 $MTCO_2e/MWh$. One additional emission rate was calculated based purely on APS's power control area without adjustments, and resulted in an emission rate of 0.8448 $MTCO_2e/MWh$.

Objectives of the Assessment

In order to compare an out-of-state entity's actual greenhouse gas (GHG) emission rate to GHG emissions reported to the ARB using the default emission factor for unspecified electricity imports of 0.428 $MTCO_2e/MWh$, this assessment used publicly-available data to develop a set of emission rates for Arizona Public Service Company (APS), as an example of a non-California entity.

The objective of this analysis was to calculate emission rates for APS under three generation scenarios:

1. the entire APS portfolio
2. the APS portfolio excluding nuclear generation, and
3. the APS portfolio excluding nuclear and renewable generation.

Due to the availability of data, this study looked at these three generation scenarios for both 2009 and 2012. Additionally, it developed an emission rate for the entire Power Control Area, using eGRID. This led to a total of seven emission rates.

Description of Data

This assessment relied on data from the U.S. EPA's eGRID, a comprehensive inventory of environmental attributes of electric power systems, based on available plant-specific data for all U.S. electricity generating plants that provide power to the electric grid and report data to the U.S. government.[1]

[1] http://www.epa.gov/cleanenergy/energy-resources/egrid/index.html#download

The 2012 version of eGRID is a compilation of 2009 data. In order to complete a thorough, objective, and up-to-date assessment of GHG emissions, this analysis used the eGRID for all sources of generation within APS's service territory, and used APS's 2012 Integrated Resource Plan (IRP) to make adjustments to APS's portfolio based on APS's share of ownership of a number of plants, both in 2009 and 2012. The APS 2012 IRP was also used as the basis for adding renewable generation into the 2012 generation scenarios.

Plant and Generator Information

The plants listed in Table 1 were included in the 2009 emissions assessment.

Plant/Generator	Generation Category	Nameplate Capacity (MW)
Catalyst Paper Inc. - Snowflake Mill	Coal	70.5
Cholla	*Coal*	*714.0*
Douglas	Oil	21.4
Dry Lake	Wind	63.0
Gila River Power Station	Gas	2,476.0
Ocotillo	Gas	334.0
Prescott Airport	Solar	2.1
Red Hawk	Gas	1,136.0
Saguaro	Gas	435.5
Snowflake White Mountain Power LLC	Biomass (Wood waste solids)	27.2
Sundance	Gas	450.0
West Phoenix	Gas	1,206.8
Yucca	Gas	385.5
Yuma Cogeneration Associates	Gas	62.6
Four Corners	*Coal*	*791.0*
Navajo	*Coal*	*315.0*
Palo Verde	*Nuclear*	*1,146.0*

Table 1. Plants included in 2009 Emissions Assessment

The eGRID attributes all generation and associated emissions from the Cholla power plant (coal), Four Corners power plant (coal), Navajo Generating Station (coal), and Palo Verde Nuclear Generating Station to APS; however the APS 2012 IRP states that APS only owns a portion of each plant.[2] This assessment adjusted the eGRID nameplate capacity values to

[2] Arizona Public Service Company 2012 Integrated Resource Plan. March 2012. http://www.aps.com/library/resource%20alt/2012ResourcePlan.pdf

reflect the nameplate capacity values specified in the 2012 IRP for all four plants in both the 2009 and 2012 generation scenarios.[3]

Plant/Generator	eGRID Nameplate Capacity (MW)	Adjusted Nameplate Capacity for 2009 and 2012 (MW)
Cholla	1,128.8	714.0
Four Corners	2,269.6	791.0
Navajo	2,409.3	315.0
Palo Verde	4,209.3	1,146.0

Table 2. Adjustments made to four plants based on APS's 2012 IRP

Special attention was given to Four Corners power plant. The 2012 IRP states APS's intent to purchase 48 percent of Southern California Edison's (SCE) share of Units 4 and 5 of the plant, and to retire Units 1, 2, and 3 in 2012. However this transaction was still pending at the time of this assessment, therefore no additional adjustments were made to the data between 2009 and 2012. This analysis used a nameplate capacity of 791 MW from Four Corners for both 2009 and 2012, as specified in the 2012 IRP.

Addition of New Resources

The 2012 generation scenarios included an additional 372 MW of renewable generation, listed in Table 3, in addition to all of the plants listed in Table 1. The only exception is the 2.1 MW Prescott Airport, which was deleted from the 2009 generation sources and replaced with the 10 MW SunEdison Prescott Solar Plant for the 2012 generation scenarios.

Plant/Generator	Generation Category	Nameplate Capacity (MW)
Small-scale Solar projects	Solar PV	6
Paloma Solar Plant	Solar PV	17
Cotton Center Solar Plant	Solar PV	17
Hyder Solar Plant	Solar PV	16
Argonne Mesa Wind Project	Wind	90
Salton Sea Geothermal Project	Geothermal	10
Glendale Biogas Project	Biomass/Biogas (Landfill Gas)	2.8
High Lonesome Wind Project	Wind	100
Perrin Ranch Wind Project	Wind	99
RE Ajo 1	Solar PV	4.5
SunEdison Prescott Solar Plant[4]	Solar PV	10

Table 3. Plants included in 2012 Emissions Assessment

[3] This analysis assumed, perhaps conservatively, that APS owned the same percentage of each of the plants listed in Table 2 in 2009 as in 2012.

[4] SunEdison's Prescott Solar Plant in 2012 replaced the Prescott Airport project listed in the 2009 eGRID data for the 2012 analysis.

Power Control Area Data

The eGRID also categorizes generation by individual power control areas (PCA), which eGRID defines as "a portion of an integrated power grid for which a single dispatcher has operational control of all electric generators".[5] This breakdown of data includes many of the plants listed above, and provides aggregated values for annual net generation (MWh) and annual CO_2 equivalent emissions (tons); the two values from which an emission rate can be calculated. The plants included in APS's PCA in the eGRID are listed below in Table 4. The PCA data described in Table 4 does not appear to include generation from Navajo power plant (coal), Gila River Power Station (gas), or Palo Verde Nuclear Generating Station. It is also worth noting that the PCA data fully attributes all generation and emissions of the various power plants to APS, without adjusting for partial ownership.

Plant Name	Generation Category	Nameplate Capacity (MW)
Catalyst Paper Inc. - Snowflake Mill	Coal	70.5
Cholla	Coal	1,128.8
Douglas	Oil	21.4
Dry Lake	Wind	63.0
Four Corners	Coal	2,269.6
Ocotillo	Gas	334.0
Prescott Airport	Solar	2.1
Red Hawk	Gas	1,136.0
Saguaro	Gas	435.5
Snowflake White Mountain Power LLC	Biomass (wood waste solids)	27.2
Sundance	Gas	450.0
West Phoenix	Gas	1,206.8
Yucca	Gas	385.5
Yuma Cogeneration Associates	Gas	62.6

Table 4. Plant data included in APS Power Control Area in eGRID

Assumptions and Methodology

Annual Net Generation Calculations

To calculate annual net generation for the adjusted plants and generators in Table 1, this analysis applied the capacity factors provided for the various plants in eGRID to the adjusted nameplate capacity values.

In order to calculate annual net generation of new renewable energy resources, this analysis assumed the following capacity factors: 85 percent for biomass and biogas[6], 91 percent for

[5] TranSystems. E.H. Pechan, formerly E.H. Pechan & Associates, Inc. The Emissions & Generation Resource Integrated Database for 2012 (eGRID2012) Technical Support Document. April 2012. P. 25.

[6] Mills, Andrew, Amol Phadke, and Ryan Wiser. Exploration of Resource and Transmission Expansion Decisions in the Western Renewable Energy Zone Initiative. http://eetd.lbl.gov/EA/EMP

geothermal[7], 31 percent for wind[8], and 25 percent for fixed PV[9]. These capacity factors were then applied to the nameplate capacity values stated in the 2012 IRP and used in the 2012 generation scenarios.

Annual CO_2 Equivalent Emissions

For the 2012 generation scenarios, additional calculations were necessary to determine the emissions associated with renewable generation; in particular, biomass/biogas and geothermal. This analysis used an emission rate of .0272 $MTCO_2e$ for the Salton Sea Geothermal Project, which was based on 2009 generation and emissions data from eGRID.[10] This analysis also assumed an emission rate of 0.00 for the Glendale Biogas Project, based on the emission rate provided in the eGRID data for all other landfill gas plants.

In order to obtain the annual CO_2 equivalent emissions for the 2009 adjusted generation, this analysis relied on the annual CO_2 equivalent emission rates associated with the plants provided in the eGRID, and applied them to the revised annual net generation values.

Results

The results of the emissions assessment using adjusted 2009 eGRID data showed a range of emission rates for APS between 0.5086 $MTCO_2e/MWh$ and 0.7196 $MTCO_2e/MWh$ for the 2009 and 2012 generation scenarios.

Generation Scenario	2009 Emission Rate ($MTCO_2e/MWh$)	2012 Emission Rate ($MTCO_2e/MWh$)
APS portfolio	0.5241	0.5086
APS portfolio, excluding nuclear generation	0.6957	0.6686
APS portfolio, excluding nuclear and renewable generation	0.6950	0.7196

Table 5. Emission rates for 2009 and 2012 Generation Scenarios

The overall emission rate for the entire APS PCA, based solely on the eGRID data with no adjustments was 0.8448 $MTCO_2e/MWh$.

[7] The assumed geothermal capacity factor is based on actual eGRID data for the Salton Sea Geothermal Project.
[8] Mills, Andrew, Amol Phadke, and Ryan Wiser. Exploration of Resource and Transmission Expansion Decisions in the Western Renewable Energy Zone Initiative. http://eetd.lbl.gov/EA/EMP
[9] Ibid.
[10] The eGRID data lists this generation resource as belonging to Imperial Irrigation District, not APS.

Power Control Area	PCA annual net generation (MWh)	PCA annual CO2 equivalent emissions (MT)
Arizona Public Service Company	29,852,663.6	25,220,280.7
PCA Emission Rate	***0.8448* MTCO$_2$e/MWh**	

Table 6. Unadjusted emission rate for APS Power Control Area

Discussion

2009 vs. 2012 Generation Scenarios

The results indicate that 2012 GHG emissions for APS's entire generation portfolio reduced by 0.0155 MTCO$_2$e/MWh since 2009. This can be explained by the 372 MW increase in renewable generation, which, when aggregated, had an emission rate of 0.0021 MTCO$_2$e/MWh.

Excluding nuclear and renewable generation from the analysis in both 2009 and 2012 logically caused the emission rate to increase, leaving only higher-emitting resources in the calculation. The rate increased more dramatically in 2012 (+0.2110 MTCO$_2$e/MWh), than it did in 2009 (+0.1709 MTCO$_2$e/MWh). Again, this can most likely be attributed to the addition of new renewable generation between 2009 and 2012.

Power Control Area Emission Rate

The calculated PCA value was higher than the other emission rates calculated in this assessment, most likely because eGRID attributed the full generation and emissions output of three coal plants within APS's power control area to APS alone, rather than to the multiple owners. Further, the PCA calculation does not include the GHG emissions-free generation of the Palo Verde Nuclear Generating Station, which would lower the overall emission rate of the portfolio. Nonetheless, the value provides an upper bound to the range of emission rates calculated in this assessment.

Conclusion

The range of emission rates offered in this analysis is intended to provide a sample of possible generation scenarios, with a number of adjustments, in an attempt to see how emission rates might change over time and with new procurement decisions. While it is difficult to assess the amount and type of generation resources that California is importing, it is important to look at the range of emission rates to understand the mix of generation in a system at a given time.

Assessment Prepared by Michael Hendrix and Danielle Osborn Mills, Atkins North America, Inc.

ATKINS

Appendix: Emission Rate Calculations

APS 2009 Emission Rate for Total Portfolio									
Plant name	Utility service territory	Power control area name	Plant primary fuel	primary generation category	Plant capacity factor	Plant nameplate capacity (MW)	Plant annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG Emissions Factor (MTCO2e/MWh)
Catalyst Paper Inc. - Snowflake Mill	Arizona Public Service	APS	SUB	COAL	0.3959	70.5	244,517.3	135,953.48	0.6129
Cholla	APS	APS	SUB	COAL	0.7318	*714.0*	*4,577,145.6*	*4,880,769.99*	*1.0663*
Douglas	APS	APS	DFO	OIL	0.0003	21.4	56.0	115.86	2.2805
Dry Lake	APS	APS	WND	WIND	0.0535	63.0	29,545.0	0.00	0.0000
Gila River Power Station	APS	Gila River Power	NG	GAS	0.2944	2,476.0	6,386,134.0	2,626,011.64	0.4533
Ocotillo	APS	APS	NG	GAS	0.0278	334.0	81,461.0	56,400.61	0.7632
Prescott Airport	APS	APS	SUN	SOLAR	0.3427	2.1	6,304.0	0.00	0.0000
Red Hawk	APS	APS	NG	GAS	0.4026	1,136.0	4,006,358.0	1,612,487.35	0.4437
Saguaro	APS	APS	NG	GAS	0.0239	435.5	91,276.0	63,160.23	0.7628
Snowflake White Mountain Power LLC	APS	APS	WDS	BIOMASS	0.6036	27.2	143,822.0	6,397.00	0.0490
Sundance	APS	APS	NG	GAS	0.0424	450.0	166,981.0	100,223.66	0.6616
West Phoenix	APS	APS	NG	GAS	0.1439	1,206.8	1,521,173.0	528,582.94	0.3830
Yucca	APS	APS	NG	GAS	0.1138	385.5	384,402.0	231,141.53	0.6628
Yuma Cogeneration Associates	APS	APS	NG	GAS	0.5492	62.6	301,143.3	115,244.12	0.4218
Four Corners	APS	APS	SUB	COAL	0.7866	*791.0*	*5,450,477.3*	*5,123,557.46*	*0.9400*
Navajo	SRP	SRP	BIT	COAL	0.7648	*315.0*	*2,110,389.1*	*2,260,179.11*	*1.0710*
Palo Verde				NUC	0.8315	*1,146.0*	*8,347,395.2*	*0.00*	*0.0000*
Total 2009 Plant and Gen							***33,848,579.8***	***17,740,224.98***	
2009 APS Portfolio Emission Rate									***0.5241***

ATKINS

APS 2009 Emission Rate, Excluding Nuclear Generation									
Plant name	Utility service territory name	Power control area name	Plant primary fuel	Plant primary fuel generation category	Plant capacity factor	Plant nameplate capacity (MW)	Plant annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG Emissions Factor (MTCO2e/MWh)
Catalyst Paper Inc. - Snowflake Mill	APS	APS	SUB	COAL	0.3959	70.5	244,517.3	135,953.48	0.6129
Cholla	APS	APS	SUB	COAL	0.7318	*714.0*	*4,577,145.6*	*4,880,769.99*	*1.0663*
Douglas	APS	APS	DFO	OIL	0.0003	21.4	56.0	115.86	2.2805
Dry Lake	APS	APS	WND	WIND	0.0535	63.0	29,545.0	0.00	0.0000
Gila River Power Station	APS	Gila River Power	NG	GAS	0.2944	2,476.0	6,386,134.0	2,626,011.64	0.4533
Ocotillo	APS	APS	NG	GAS	0.0278	334.0	81,461.0	56,400.61	0.7632
Prescott Airport	APS	APS	SUN	SOLAR	0.3427	2.1	6,304.0	0.00	0.0000
Red Hawk	APS	APS	NG	GAS	0.4026	1,136.0	4,006,358.0	1,612,487.35	0.4437
Saguaro	APS	APS	NG	GAS	0.0239	435.5	91,276.0	63,160.23	0.7628
Snowflake White Mountain Power LLC	APS	APS	WDS	BIOMASS	0.6036	27.2	143,822.0	6,397.00	0.0490
Sundance	APS	APS	NG	GAS	0.0424	450.0	166,981.0	100,223.66	0.6616
West Phoenix	APS	APS	NG	GAS	0.1439	1,206.8	1,521,173.0	528,582.94	0.3830
Yucca	APS	APS	NG	GAS	0.1138	385.5	384,402.0	231,141.53	0.6628
Yuma Cogeneration Associates	APS	APS	NG	GAS	0.5492	62.6	301,143.3	115,244.12	0.4218
Four Corners	APS	APS	SUB	COAL	0.7866	*791.0*	*5,450,477.3*	*5,123,557.46*	*0.9400*
Navajo	SRP	SRP	BIT	COAL	0.7648	*315.0*	*2,110,389.1*	*2,260,179.11*	*1.0710*
Total 2009 Plant and Gen							***25,501,184.5***	***17,740,224.98***	
2009 APS Emission Rate, Excluding Nuclear Generation									***0.6957***

ATKINS

2009 Emission Rate, Excluding Nuclear and Renewable Generation									
Plant name	Utility service territory name	Power control area name	Plant primary fuel	Plant primary fuel generation category	Plant capacity factor	Plant nameplate capacity (MW)	Plant annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG Emissions Factor (MTCO2e/MWh)
Catalyst Paper Inc. - Snowflake Mill	APS	APS	SUB	COAL	0.3959	70.5	244,517.3		0.6129
Cholla	APS	APS	SUB	COAL	0.7318	*714.0*	*4,577,145.6*	*4,880,769.99*	*1.0663*
Douglas	APS	APS	DFO	OIL	0.0003	21.4	56.0	115.86	2.2805
Gila River Power Station	APS	Gila River Power	NG	GAS	0.2944	2,476.0	6,386,134.0	2,626,011.64	0.4533
Ocotillo	APS	APS	NG	GAS	0.0278	334.0	81,461.0	56,400.61	0.7632
Red Hawk	APS	APS	NG	GAS	0.4026	1,136.0	4,006,358.0	1,612,487.35	0.4437
Saguaro	APS	APS	NG	GAS	0.0239	435.5	91,276.0	63,160.23	0.7628
Sundance	APS	APS	NG	GAS	0.0424	450.0	166,981.0	100,223.66	0.6616
West Phoenix	APS	APS	NG	GAS	0.1439	1,206.8	1,521,173.0	528,582.94	0.3830
Yucca	APS	APS	NG	GAS	0.1138	385.5	384,402.0	231,141.53	0.6628
Yuma Cogeneration Associates	APS	APS	NG	GAS	0.5492	62.6	301,143.3	115,244.12	0.4218
Four Corners	APS	APS	SUB	COAL	0.7866	*791.0*	*5,450,477.3*	*5,123,557.46*	*0.9400*
Navajo	SRP	SRP	BIT	COAL	0.7648	*315.0*	*2,110,389.1*	*2,260,179.11*	*1.0710*
Total 2009 Plant and Gen							***25,321,513.5***	***17,597,874.49***	
2009 APS Emission Rate, Excluding Nuclear and Renewable Generation									***0.6950***

ATKINS

APS 2012 Emission Rate for Total Portfolio										
Plant name	Utility service territory name	Power control area name	Plant primary fuel	Plant primary coal/oil/gas/ other fossil fuel category	Plant primary fuel generation category	Plant capacity factor	Plant nameplate capacity (MW)	Plant annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG Emissions Factor (MTCO2e/MWh)
Catalyst Paper Inc. - Snowflake Mill	APS	APS	SUB	COAL	COAL	0.3959	70.5	244,517.3	135,953.5	0.6129
Cholla	APS	APS	SUB	COAL	COAL	0.7318	*714.0*	*4,577,145.6*	*4,880,770.0*	*1.0663*
Douglas	APS	APS	DFO	OIL	OIL	0.0003	21.4	56.0	115.9	2.2805
Dry Lake	APS	APS	WND		WIND	0.0535	63.0	29,545.0	0.0	0.0000
Gila River Power Station	APS	Gila River Power	NG	GAS	GAS	0.2944	2,476.0	6,386,134.0	2,626,011.6	0.4533
Ocotillo	APS	APS	NG	GAS	GAS	0.0278	334.0	81,461.0	56,400.6	0.7632
Red Hawk	APS	APS	NG	GAS	GAS	0.4026	1,136.0	4,006,358.0	1,612,487.3	0.4437
Saguaro	APS	APS	NG	GAS	GAS	0.0239	435.5	91,276.0	63,160.2	0.7628
Snowflake White Mountain Power LLC	APS	APS	WDS		BIOMASS	0.6036	27.2	143,822.0	6,397.0	0.0490
Sundance	APS	APS	NG	GAS	GAS	0.0424	450.0	166,981.0	100,223.7	0.6616
West Phoenix	APS	APS	NG	GAS	GAS	0.1439	1,206.8	1,521,173.0	528,582.9	0.3830
Yucca	APS	APS	NG	GAS	GAS	0.1138	385.5	384,402.0	231,141.5	0.6628
Yuma Cogeneration Associates	APS	APS	NG	GAS	GAS	0.5492	62.6	301,143.3	115,244.1	0.4218
Four Corners	APS	APS	SUB	COAL	COAL	0.7866	*791.0*	*5,450,477.3*	*5,123,557.5*	*0.9400*
Navajo	SRP	SRP	BIT	COAL	COAL	0.7648	*315.0*	*2,110,389.1*	*2,260,179.1*	*1.0710*
Palo Verde					NUC	0.8315	*1,146.0*	*8,347,395.2*	*0.0*	*0.0000*
2009 Plant and Gen								*33,842,275.8*	*17,740,225.0*	*0.5242*
APS 2012 Renewable Total								*1,040,048.52*	*2,177.2*	*0.0021*
APS 2012 Total Portfolio								***34,882,324.30***	***17,742,402.2***	***0.5086***

ATKINS

APS 2012 Emission Rate, Excluding Nuclear Generation										
Plant name	Utility service territory name	Power control area name	Plant primary fuel	Plant primary coal/oil/gas/ other fossil fuel category	Plant primary fuel generation category	Plant capacity factor	Plant nameplate capacity (MW)	Plant annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG Emissions Factor (MTCO2e/MWh)
Catalyst Paper Inc. - Snowflake Mill	APS	APS	SUB	COAL	COAL	0.3959	70.5	244,517.3	135,953.5	0.6129
Cholla	APS	APS	SUB	COAL	COAL	0.7318	*714.0*	*4,577,145.6*	*4,880,770.0*	*1.0663*
Douglas	APS	APS	DFO	OIL	OIL	0.0003	21.4	56.0	115.9	2.2805
Dry Lake	APS	APS	WND		WIND	0.0535	63.0	29,545.0	0.0	0.0000
Gila River Power Station	APS	Gila River Power	NG	GAS	GAS	0.2944	2,476.0	6,386,134.0	2,626,011.6	0.4533
Ocotillo	APS	APS	NG	GAS	GAS	0.0278	334.0	81,461.0	56,400.6	0.7632
Red Hawk	APS	APS	NG	GAS	GAS	0.4026	1,136.0	4,006,358.0	1,612,487.3	0.4437
Saguaro	APS	APS	NG	GAS	GAS	0.0239	435.5	91,276.0	63,160.2	0.7628
Snowflake White Mountain Power LLC	APS	APS	WDS		BIOMASS	0.6036	27.2	143,822.0	6,397.0	0.0490
Sundance	APS	APS	NG	GAS	GAS	0.0424	450.0	166,981.0	100,223.7	0.6616
West Phoenix	APS	APS	NG	GAS	GAS	0.1439	1,206.8	1,521,173.0	528,582.9	0.3830
Yucca	APS	APS	NG	GAS	GAS	0.1138	385.5	384,402.0	231,141.5	0.6628
Yuma Cogeneration Associates	APS	APS	NG	GAS	GAS	0.5492	62.6	301,143.3	115,244.1	0.4218
Four Corners	APS	APS	SUB	COAL	COAL	0.7866	*791.0*	*5,450,477.3*	*5,123,557.5*	*0.9400*
Navajo	SRP	SRP	BIT	COAL	COAL	0.7648	*315.0*	*2,110,389.1*	*2,260,179.1*	*1.0710*
2009 Plant and Gen								*25,494,880.5*	*17,740,225.0*	*0.6958*
2012 Renewable Total								*1,040,048.52*	*2,177.2*	*0.0021*
APS 2012 Emission Rate, Excluding Nuclear Generation								***26,534,929.06***	***17,742,402.2***	***0.6686***

ATKINS

APS 2012 Emission Rate, Excluding Nuclear and Renewable Generation										
Plant name	Utility service territory name	Power control area name	Plant primary fuel	Plant primary coal/oil/gas/ other fossil fuel category	Plant primary fuel generation category	Plant capacity factor	Plant nameplate capacity (MW)	Plant annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG Emissions Factor (MTCO2e/MWh)
Catalyst Paper Inc. - Snowflake Mill	APS	APS	SUB	COAL	COAL	0.3959	70.5	244,517.3	135,953.5	0.6129
Cholla	APS	APS	SUB	COAL	COAL	0.7318	*714.0*	*4,577,145.6*	*5,368,852.4*	*1.1730*
Douglas	APS	APS	DFO	OIL	OIL	0.0003	21.4	56.0	115.9	2.2805
Gila River Power Station	APS	Gila River Power	NG	GAS	GAS	0.2944	2,476.0	6,386,134.0	2,626,011.6	0.4533
Ocotillo	APS	APS	NG	GAS	GAS	0.0278	334.0	81,461.0	56,400.6	0.7632
Red Hawk	APS	APS	NG	GAS	GAS	0.4026	1,136.0	4,006,358.0	1,612,487.3	0.4437
Saguaro	APS	APS	NG	GAS	GAS	0.0239	435.5	91,276.0	63,160.2	0.7628
Sundance	APS	APS	NG	GAS	GAS	0.0424	450.0	166,981.0	100,223.7	0.6616
West Phoenix	APS	APS	NG	GAS	GAS	0.1439	1,206.8	1,521,173.0	528,582.9	0.3830
Yucca	APS	APS	NG	GAS	GAS	0.1138	385.5	384,402.0	231,141.5	0.6628
Yuma Cogeneration Associates	APS	APS	NG	GAS	GAS	0.5492	62.6	301,143.3	115,244.1	0.4218
Four Corners	APS	APS	SUB	COAL	COAL	0.7866	*791.0*	*5,450,477.3*	*5,123,557.5*	*0.9400*
Navajo	SRP	SRP	BIT	COAL	COAL	0.7648	*315.0*	*2,110,389.1*	*2,260,179.1*	*1.0710*
2009 Plant and Gen								***25321513.5***	***18,221,910.3***	***0.7196***
APS 2012 Emission Rate, Excluding Nuclear and Renewable Generation										*0.7196*

Renewable Generation Included in 2012 APS IRP	Resource technology	Generator capacity factor	Generator nameplate capacity (MW)	Generator annual net generation (MWh)	Plant annual CO2 equivalent emissions (metric tons)	GHG emission rate (MTCO2e/MWh)
Small-scale Solar projects	PV	0.25	6	13,140.0	0.00	0.0000
Paloma Solar Plant	PV	0.25	17	37,230.0	0.00	0.0000
Cotton Center Solar Plant	PV	0.25	17	37,230.0	0.00	0.0000
Hyder Solar Plant	PV	0.25	16	35,040.0	0.00	0.0000
Argonne Mesa Wind Project (PPA)	Wind	0.31	90	244,404.0	0.00	0.0000
Salton Sea Geothermal Project (PPA)	Geothermal	0.91	10	79,996.3	2,177.24	0.0272
Glendale Biogas Project (PPA)	Biogas	0.85	2.8	20,848.8	0.00	0.0000
High Lonesome Wind Project (PPA)	Wind	0.31	100	271,560.0	0.00	0.0000
Perrin Ranch Wind Project (PPA)	Wind	0.31	99	268,844.4	0.00	0.0000
RE Ajo 1 (PPA)	PV	0.25	4.5	9,855.0	0.00	0.0000
SunEdison Prescott Solar Plant (PPA)	PV	0.25	10	21,900.0	0.00	0.0000
Total Renewable Generation		33.90	372.3	1,040,048.5	2,177.24	0.0021

Attachment 2

May 8, 2013

Distributed To: **All APS WSPP and EEI Counterparties**

Re: **California Cap-and-Trade Resource Shuffling Concerns**

Arizona Public Service Company ("APS") has been receiving inquiries from counterparties related to selling resource-specific energy for subsequent import to California for the purpose of avoiding a carbon obligation. APS believes this could constitute resource shuffling because replacement energy for APS' load and obligations would likely come from coal or gas resources.

Therefore, APS is distributing this communication to its counterparties in order to clarify that any power that is sold from APS has been generated by the APS power system and not specifically by a specific generating resource. For example, power that is tagged with Palo Verde Nuclear Generating Station listed as the Source on the e-Tag consists of power that may have been generated from a mix of resources, including coal, gas, nuclear, renewable, and market purchases. The e-Tag may identify Palo Verde Nuclear Generating Station as the Source. However, APS is selling system resources and not generator-specific power.

Counterparties should review California's Mandatory Reporting Regulation ("MRR") (Title 17, California Code of Regulations ("CCR"), Sections 95100-95158) and the Cap-and-Trade regulations (Title 17, CCR, Sections 95800-96023) in order to determine their own obligations when selling power that is California-bound.

APS understands that the California Air Resources Board has a revision to its original Resource Shuffling Guidance due out this June for public comment. APS will re-examine its position once the revised guidance has been approved and finalized.

If you have any questions, please contact Jeanine Divis at (602) 250-3797.

Sincerely,

Justin Thompson
Director of Business Support, Marketing & Trading