

Testimony for Agenda Item, 6D

Western Riverside Council of Governments Executive Committee

AGENDA Monday, August 7, 2017 2:00 p.m.

County of Riverside Administrative Center

4080 Lemon Street, 1st Floor, Board Chambers Riverside, CA 92501

Flaws in WRCOG CCA

Concerns & Warning to Executive Committee

James Phelps



August 4, 2017

WRCOG CCA

August 7, 2017 Agenda – Requested items for WRCOG CCA (subset of Inland Choice Power)

Community Choice Aggregation Program

Barbara Spoonhour, WRCOG P. 329

Requested Actions:

- 1-- Approve the CCA Joint Powers Agreement and Bylaws.
- 2-- Approve the draft agreement between WRCOG and the CCA for staffing services.
- 3-- Direct and authorize the Executive Director to negotiate and enter into an agreement with **The Energy Authority** and **EES Consulting** to provide CCA Operational Services.

Comments / Concerns / Flaws:

CCA Joint Powers Authority Agreement and Bylaws

Section 5: Withdrawal and Termination (p. 343 of the agenda packet)

5.2 Right to withdraw prior to program launch

A municipality may withdraw only if The Energy Authority's (TEA) consultant determines that the CCA cannot beat SCE prices or greenhouse gas (GHG) emission rate. The GHG emission rate methodology already appears to be **significantly flawed**, per page 10 of 15 below. Nevertheless, using TEA's consultant for determining the viability of TEA introduces a conflict-of-interest that does not represent an objective outcome.

TEA's consultant evaluates **only the "baseline" offering's prices and GHGs**. What about the other products or energy volumes that are outside of the baseline offering?

- The consultant's review is not specifically identified on the CCA bar chart.
- **Who conducts a third-party review of the consultant's evaluation?**
- How can TEA consultant know the prices and associated GHGs of TEA's energy if the total volumes of energy are not known, and would not be known, until total enrollment of consumers into the CCA in Q1 of 2019?
- How can TEA consultant determine GHG emission rate if TEA uses unbundled RECs and firm-and-shape RECs to green-wash when those RECs will no longer be allowed after the consultant's "evaluation"? AB 1110 is currently being implemented (full implementation by 2020?), which will eliminate the inclusion of claimed "zero-carbon emissions" from RECs. **Isn't it a misrepresentation to include RECs in "zero-carbon" calculations, only to have RECs eliminated from use a year or two later?**

5.4 Continuing Liability

Municipalities remain liable for paying off Power Purchase Agreement (PPA) volumes that are attributed to them if they withdraw from ICP CCA. So, if a municipality determines that prices

WRCOG CCA

are higher (than baseline offering) or if the energy is dirtier than SCE's, the municipality(s) are responsible for paying millions of dollars. Departure is likely due to the following:

1. An energy supplier arrives on scene and offers long-term, lower priced energy volume;
2. An energy supplier arrives on scene and offers rooftop solar farms that cover municipality(s) electric load;
3. Municipality(s) disagree with the many stakeholders who also control ICP;
4. Another CCA solicits municipality(s), offering superior terms;
5. Etc.

- If CCA JPA claims it can resell the municipality(s) PPA energy volume(s) when municipality(s) balk at joining the CCA, the municipality must consider who would want to purchase its more expensive energy volume, or its dirtier-than-SCE's energy volume. After all, these are the key drivers that caused the municipality(s) to depart the JPA in the first place.
- Who is responsible for paying the departed party's Power Purchase Agreements if the secondary buyer, arranged by the JPA, decides it no longer wants the municipality(s) PPA energy?
- If the municipality departs for another energy source, causing some or all of the residential ratepayers to also depart from the JPA, is the municipality responsible **only for the "municipal portion of the PPA, or the entire portion"** that applies to the municipality boundaries? This is not clear in the JPA agreement.

3 Involuntary Termination

A JPA member may be terminated by the CCA board. This might occur if the municipality objected to a JPA decision, such as locating a biomass plant in the borders of the municipality. The terminated Party's liabilities, including Power Purchase Agreement financial liabilities, **remain** the responsibility of the terminated Party.

Energy

CCA Bar Chart, **Technical/Energy Services**, third line, identifies "**default and voluntary products.**" What is the volume of Renewable energy Certificates (RECs), unbundled and firm-and-shape, that are included in these products? AB 1110 is currently being implemented to eliminate RECs by 2020.

- How can consumers and municipalities know how many RECs are included in The Energy Authority's consultant's *pre-enrollment* comparison with SCE? RECs skew the appearance of GHG-reductions and have a large impact on cutting the prices of what appears to be clean energy, but isn't clean energy.

WRCOG CCA

→ SCE exit fees. The Business Plan states that these exit fees (PCIA) are critical to competitiveness of the CCA. SCE, San Diego Gas & Electric, and PG&E, have initiated litigation at the CPUC to **increase the PCIA**.

Conflict of Interest

WRCOG Executive Committee, Monday August 7, 2017, Agenda Item 6D, states under item 3 of the Requested Actions:

Direct and authorize the Executive Director to negotiate and enter into an agreement with The Energy Authority and EES Consulting to provide CCA Operational Services.

→ EES Consulting is in conflict of interest by preparing the CCA Feasibility Study that was used to justify launching the CCA, then circling back to receive a contract for Operation Services from the CCA it justified should be launched.

WRCOG CCA Business Plan (Footnote 1 at end of this report)

December 8, 2016 (latest public version – reviewed and analyzed below)

November 7, 2016 attached to WRCOG Staff Report, February 6, 2017, Item 6.B

Review of entire WRCOG CCA (Inland Choice Power) Business Plan (12-8-2016) examined all aspects of the document. The net result of the review is included in the attached pages. It can be stated with certainty that:

- The Business Plan includes basic mistakes about the renewable Portfolio Standard (RPS) that reveal the Business Plan author(s) do not understand the renewable energy market, which undermines ICP CCA, from concept to roll out;
- The Business Plan fails to address all GHG emissions for which ICP CCA is responsible, eliminating most, or all, of the “GHG reductions” that ICP CCA claims;
- Recent litigation of exit fees (PCIA) at the CPUC puts ICP CCA’s economic benefits on uncertain ground. A changing PCIA can have a significant effect on the competitive position of ICP CCA compared to SCE prices. Furthermore, this (stealth) **cost** is not transparently borne out by the Business Plan (p. 6 and 69), which states: *Customers will pay the power supply charges set by ICP and no longer pay the higher **costs** of SCE power supply.* ICP CCA is responsible for triggering the PCIA, yet ICP CCA does not

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pay this cost on behalf of consumers. PCIA remains in litigation for next 12 – 18 months;

- The Business Plan fails to address prices increases that will follow implementation of AB 1110 (anti-REC law). This will drive prices higher for ICP as it moves toward “real” renewable energy, triggering departure for lower-cost alternatives, including municipal departure(s). This compounds with PCIA price changes. See JPA withdrawal discussion, above;
- Price savings for consumers are not defined. The Business Plan appears to overstate its ability to achieve meaningful price reductions for consumers. Page 69 of the Business Plan – RATE IMPACTS AND COMPARISONS -- states “*The first impact associated with forming ICP will be lower electricity bills for ICP customers.*” As a comparison, long-established MCE’s rates are less than 1% lower than Pacific Gas & Electric’s prices after seven years of operation.
- The Business Plan fails to specifically address the growth of local solar farms, the energy from which was available in early 2016 to individuals and communities in the form of SCE’s “Green Rate” (aka “Community Renewables”). Alternately, ICP’s overall plan is to construct fifty 1 MW solar farms, which will cost approximately \$100 million, plus land-use costs.
- The Business Plan fails to address displaced SCE employees, or the economic losses in the communities associated with these losses;
- This review concludes that the Business Plan’s omissions and flaws may be termed ‘fatal’. Accordingly, the primary result of implementing ICP will be the creation of a new government agency of unsubstantiated economic or environmental value.

RENEWABLE ENERGY

The Business Plan includes key mistakes that indicate **the author does not understand California’s Renewable Portfolio Standard (RPS)**. The Business Plan’s 50% and 100% clean portfolios are also loaded with unbundled RECs and firm-and-shape RECs that conceal actual underlying dirty energy that is delivered to California, while represented as “clean.”

California RPS – a \$318 million mistake in the Business Plan table

Each year a certain percentage of energy service providers’ overall portfolio must comply with specified amounts of eligible renewable power. Each of three energy portfolios in the Business

WRCOG CCA

Plan are based upon the RPS. The table below shows California's RPS mandate compared to the Business Plan's representation of the RPS on page 37.

<u>Year</u>	<u>California RPS Mandate</u> [%]	<u>Business Plan RPS Mandate</u> [%]	<u>Business Plan RPS Shortfall</u> [%]
2017	27	25	2
2018	29	25	4
2019	31	25	6
2020	33	33	OK
2021	34.8	33	1.8
2022	36.5	33	3.5
2023	38.3	33	5.3
2024	40	40	OK
2025	41.7	40	1.7
2026	43.3	40	3.3
2027	45	45	OK
2028	46.7	45	1.7
2029	48.3	45	3.3
2030	50	50	OK

This error represents a sizable liability volume and cost of required renewable energy that is not included in the Business Plan. For example, the Financial Proforma for the RPS Portfolio, (CY2019) shows WRCOG (ICP) total energy load is 4,630,793 MWh. The 6% shortfall translates to 277,848 MWh, enough to power 20,000 average sized homes per year, based upon estimated 1,100 KWh per house per month.

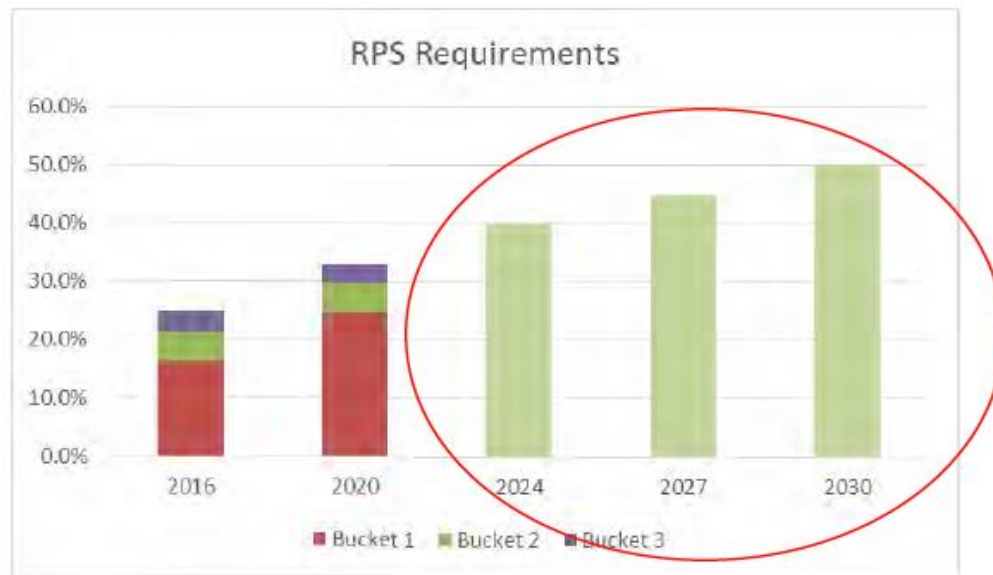
→ 159 1 MW solar farms are required to cover the Business Plan's shortfall for 2019. Using conventional construction costs for a 1 MW solar farm as included in Local renewables (solar), at full rollout (discussed at end of this section), would cost WRCOG approximately \$318 million.

Firm-and Shape RECs ("Bucket 2") – fatal flaw in the "RPS Requirement" chart

The Business Plan authors do not appear to understand California's Renewable Portfolio Standard (RPS) portfolio content categories.

P. 25 states that Exhibit 14 (below) *provides an overview of the RPS requirements until 2030*. Exhibit 14 shows in 2024 (or earlier) that 40% to 50% of "RPS Requirements" is Bucket 2 energy, aka firm-and-shape RECs. This 40% - 50% Bucket 2 energy is incorrect. The RPS allows no more than 25% for Bucket 2 for any year, beginning 2021.

Exhibit 14
California RPS Requirements as a Percent of Total Power Supply



- How can ICP's CCE's Business Plan show 40% - 50% Bucket 2, when the RPS caps it at 25%?
- Accordingly, WRCOG's RPS energy is predominantly based upon non-local renewable energy sources that are high GHG emitting. Bucket 2 is largely "substitute energy" (typically gas-fired, coal, and nuclear imports into California). This is not to disregard the likelihood that WRCOG would load *unbundled* RECs in the 50% and 100% clean energy offerings for energy volumes on top of the RPS volumes that it represents as "clean" energy.
- (Relatively inexpensive and over-used) firm-and-shape energy skews the ICP Business Plan's pricing models downward, giving better-than-actual financial appearance to WRCOG.

Unbundled RECs – dirtiest energy sold to WRCOG (ICP) customers as “clean”

By omission, the Business Plan implies that ICP intends to maximize its use of (inexpensive) unbundled RECs. Page 32 states *The Plan assumes that ICP will not rely on REC purchases to meet RPS requirements.*

→ The Business Plan neglects to state that REC purchases would not be used for energy volumes above the RPS. This applies to the 50% and 100% renewable energy offering.

It is worth noting that Marin Clean Energy also downplayed the use of RECs in its 2008 Business Plan (p. 34 of MCE document). However, through 2015 (MCE’s last public reporting) the majority of its “clean” energy was RECs. MCE’s record, through its recently released power source disclosure documentation, reveals that it green-washes 100 MWhs of dirty power with RECs (see Green-washing chart, below) for every 156 MWhs of true renewable power it actually purchased.

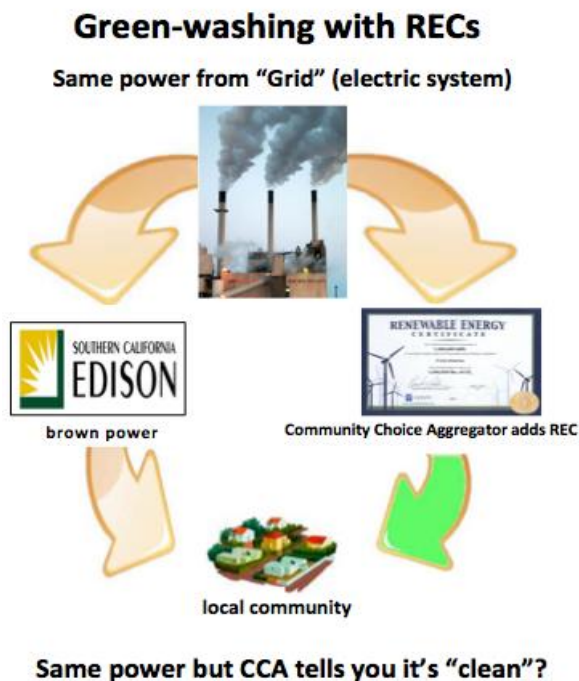
→ Unbundled RECs are not renewable energy, but are a paper-trading financial scheme that hide underlying coal and gas-fired energy that is actually delivered to customers. Overall, this is referred to as “green-washing.”

→ (Inexpensive) unbundled RECs skew downward the pricing models in the Business Plan. This flaw gives a more favorable economic appearance, than actual, to ICP and WRCOG.

Green-washing – it’s what’s behind those RECs

While the use of RECs is permissible for satisfying part of the annual RPS mandate, CCAs conflate that regulatory allowance with advertising that the underlying electrons (electricity) from coal and gas-fired generation are actual clean energy.

P. 32 of the Business Plan cites unbundled RECs as a part of the base case energy portfolio. Because RECs are a fundamental abuse of “clean” energy advertising by CCAs, it is worth restating that RECs are not actual clean energy – RECs are merely a paper-trading scheme employed by CCAs (and some municipal electric providers), resulting in the delivery of dirty power to consumers while the Community Choice Aggregator (ICP) advertises that energy as “clean.” This is known as green-washing.



ICP (WRCOG) will likely employ Marin Clean Energy’s strategy of “voluntary” unbundled RECs (combined with firm-and-shape RECs) to fill the “clean” energy gap between the RPS and ICP’s 50% or 100% products, per the following tables:

UNBUNDLED RECs IN THE 50% “CLEAN” ENERGY PORTFOLIO (w/o AB 1110)

Year	RPS Clean Energy Mandate (% of total portfolio)	RPS RECs	Gap between RPS and LA’s represented 50%	Total % RECs (dirty power)	RECs (dirty power) as % of total “clean” energy
2017	27%	3%	23%	3% + 23%	23% / 50% = 46%
2018	29%	3%	21%	3% + 21%	21% / 50% = 42%
2019	31%	3%	19%	3% + 19%	19% / 50% = 38%
2020	33%	3%	17%	3% + 17%	17% / 50% = 34%

UNBUNDLED RECs IN THE 100% “CLEAN” ENERGY PORTFOLIO (w/o AB 1110)

Year	RPS Clean Energy Mandate (% of total portfolio)	RPS RECs	Gap between RPS and LA’s represented 100%	Total % RECs (dirty power)	RECs (dirty power) as % of total “clean” energy
2017	27%	3%	73%	3% + 73%	73% / 100% = 73%
2018	29%	3%	71%	3% + 71%	71% / 100% = 71%
2019	31%	3%	69%	3% + 69%	69% / 100% = 69%
2020	33%	3%	67%	3% + 67%	67% / 100% = 67%

It should be noted that clean energy programs’ economics that rely upon use of inexpensive RECs (and associated green-washing) will likely be curtailed by AB 1110, the anti-green-washing law that is currently being implemented in Sacramento, causing WRCOG’s prices to increase.

WRCOG CCA

The effect of AB 1110 will be that “clean” energy companies such as WRCOG CCA (ICP) will no longer be able to advertise RECs as zero-GHG energy, forcing them to procure expensive bundled energy, **significantly changing the economics of ICP**. See “Plan Uncertainty” discussion, below.

Displacement from the Renewable Energy Feeding Trough – most of ICP energy isn’t clean

Page 8 of the Business Plan states that ICP will procure renewables to meet 50%, or more, of electric needs at start-up. Page 28 reads that power purchases will supply the remaining majority of the resource mix.

Thus, ICP realizes no *net-reduction* in GHGs to the extent it merely purchases output from *pre-existing* renewable facilities. This “feeding at the trough” analogy has the effect of displacing a prior purchaser of renewable power from the same facilities, resulting in no net GHG reduction since that displaced (prior) consumer must now purchase system power or gas-fired energy, or attempt to green-wash with RECs.

→ The GHG “reduction” is merely transferred from one large consumer (SCE) or municipality’s GHG reduction ledger to the new entity’ that is now “feeding in the trough,” **resulting in zero net GHG emission reduction to the atmosphere when purchasing energy from a pre-existing resource.**

Local renewables (solar), at full rollout. ~\$90 Million for 1-1/2%

Business Plan, page 71, says ICP plans to construct fifty (50) 1 MW solar farms as part of the local DER (distributed energy resources). The cost for each 1 MW farm is currently between \$2 million and \$4 million, plus land use cost, depending upon quality of panel. Each solar farm requires between 5 acres and 8 acres, depending upon exposure; San Bernardino data shows more than 8 acres per 1 MW were required for each solar farm in that county.

Thus, ICP will require approximately 400 acres, plus additional acreage as it adds new solar generation to replace declining output from the earlier solar farms as they degrade.

Based upon MCE’s empiric reporting, each 1 MW of solar produces approx. 1,725 MWh/year. 86,250 MWh/yr requires fifty (50) 1 MW solar farms, plus replacement solar due to degradation.

→ ICP’s fifty solar farms will cost slightly less than **\$90 million and produce only 1-1/2%** of ICP’s total electric load at full rollout load (2036) (see footnote 2 at end of review).

GHG REDUCTIONS

ICP Business Plan contains numerous generalities and omissions that give an erroneous impression of ICP's GHG reductions. This occurs in:

- 1) omission of zero-carbon energy in SCE's portfolio;
- 2) omission of line loss energy volumes in WRCOG's (ICP's) portfolio;
- 3) RECs in WRCOG's (ICP's) portfolio;
- 4) claiming zero-GHG (from *pre-existing* renewable energy sources).

1) Omission of Zero-Carbon Energy in SCE's Baseline GHGs

To the extent that ICP's renewable energy is purchased from pre-existing renewable energy facilities, the *reduction* claim for that energy volume is false. See "Displacement from the Renewable Energy Feeding Trough," above.

SCE's total emissions must be quantified in order to establish a baseline volume of GHGs against which ICP "reductions" are compared. However, the Business Plan fails to provide data that substantively identifies SCE's GHGs, other than reference in a CPUC footnote on page 10 and page 60 to SCE's RPS quantity. This implies that this RPS mandate is the only carbon-free energy in SCE's portfolio.

By citing the RPS only, the Business Plan fails to identify that large hydro or nuclear power constitute part of SCE's zero-carbon energy portfolio.

The latest power source disclosure for SCE (2015) shows large hydro and nuclear account for 5,151,071 MWh. It is reasonable to assume similar volumes for SCE's future years.

→ When SCE's large hydro and nuclear power are counted as zero-GHGs, SCE's GHG baseline emissions are reduced by 2.2 million tons (Metric) or 2.4 million tons (US), which represents for ICP the *addition* of the same amount, +2.2 million tons (Metric) or +2.4 million tons (U.S.) – to its stated GHG "reduction," which the Business Plan estimates between 473,993 to 837,756 tons (U.S.) of CO₂e per year by 2018 (p. 60)."

Note: Business Plan metric tonnage converted to US tons. Conversion is 1.10231 U. S. tons for 1 metric ton.

2) Omission of GHG Emissions by Disregarding "Line Loss" Energy Volumes

Page 39 of the Business Plan states: *The renewable energy requirements in the State's RPS are based on retail energy sales. To be consistent, it was assumed that the 100 percent renewable energy target would **only apply to retail energy sales** (emphasis added). The same concept applies to Portfolios 1 and 2.*

WRCOG CCA

→ This means ICP disregards the energy that is lost in the transmission & distribution of energy in all portfolios. Thus, ICP understates and underreports the GHG emissions associated with line loss power that is required to make its retail energy deliveries. Conservatively, application of a 6% line loss factor (SCE applies 8% on its recent power source disclosure statement) may be applied to ICP's annual power requirement of 5,605,000 MWh at full-rollout, or 336,300 MWh of System Power. (MCE identifies 6%). This means ICP is responsible for 317 million pounds, or 159,000 U.S. Tons of unreported GHG emissions each year after full rollout that are not addressed in its Business Plan.

AB 1110 is currently addressing line loss emissions. This will have a material effect on the "GHG reductions" claimed by ICP WRCOG.

Comparatively, SCE addresses and includes (i) line loss in Schedule 1 of its annual Power Source Disclosure to the California Energy Commission, and (ii) associated GHG emissions in the annual reporting requirements that apply to California's three investor-owned utilities.

3) RECs in ICP WRCOG's Portfolio

Each REC is the same as 1 megawatt-hour. Each REC, as used by CCAs, is tantamount to one megawatt-hour of dirty power. CCAs use RECs to rationalize advertising cleaner-than-actual energy, and to keep prices low. For more on RECs and green-washing see "green-washing," above.

4) Claiming zero-GHG from pre-existing renewable energy sources

While this energy may be zero-carbon, it does not represent a "reduction" to the atmosphere for the entity purchasing that energy. See "Displacement from the Renewable Energy Feeding Trough," above.

FINANCE – POWER SUPPLY COST PROBLEM

Financial Proforma tables in ICP's Business Plan reveals a fundamental problem that does not reconcile with another Business Plan published by the same author 5 months before ICP's Plan.

The Business Plans for WRCOG (ICP) and LA CCE include energy prices that are contrary to economic laws. LA is approximately half the size of WRCOG (megawatt-hour sales), yet LA's Business Plan calculates to power supply costs that are 3.5% less than ICP. The Business Plan author ignores economic laws as they apply to larger purchasing power and ensuing volume discounts, as can be viewed in the following table. This fundamental inconsistency puts the Business Plan into a questionable light.

WRCOG CCA

Default RPS Product (2020)	LA CCE	WRCOG CCA (ICP)	% LA is lower price than ICP
Total Energy Sales (MWh)	2,921,864	4,683,121	
Power Supply Cost (\$)	\$149,887,088	\$248,573,442	
Price per MWh	\$51.30	\$53.08	3.4

Default RPS Product (2025)	LA CCE	ICP CCA	% LA is lower price than ICP
Total Energy Sales (MWh)	3,134,997	4,953,765	
Power Supply Cost (\$)	\$179,005,281	\$293,064,953	
Price per MWh	\$57.10	\$59.16	3.5%

Default RPS Product (2030)	LA CCE	ICP CCA	% LA is lower price than ICP
Total Energy Sales (MWh)	3,333,375	5,240,050	
Power Supply Cost (\$)	\$208,779,585	\$339,780,613	
Price per MWh	\$62.63	\$64.84	3.4%

Default RPS Product (2036 – last year)	LA CCE	ICP CCA	% LA is lower price than ICP
Total Energy Sales (MWh)	3,581,583	5,605,514	
Power Supply Cost (\$)	\$252,847,304	\$411,358,419	
Price per MWh	\$70.60	\$73.38	3.8%

PLAN UNCERTAINTY AND PRICES

WRCOG (ICP) Business Plan fails to address two variables that represent potential fatal flaws to the program.

PCIA

This is the monthly exit fee that SCE levies against departing loads that are switched into Community Choice Aggregation, such as WRCOG. The Business Plan represents that Power Charge Indifference Adjustment (PCIA) is under control due to the vigilance of the clean energy community.

California utilities recently filed suit in the CPUC to revise the PCIA upward. This monthly fee must be added to consumers' electric bills, reflecting the total price for WRCOG's energy.

→ This puts WRCOG prices at a potential competitive disadvantage with SCE.

WRCOG CCA

AB 1110

The legislation was passed into law in 2016 with the express intent of halting CCA-style abuse of misrepresenting Renewable Energy Certificates (RECs) as clean or renewable energy. The net of it is that CCAs will no longer be allowed to advertise artificially low GHG emission reduction numbers unless they procure real (bundled) renewable energy that is generated in, or delivered to, California.

Since WRCOG shows that a disproportionate (and non-allowed) amount of its energy will be Bucket 2 (*firm-and-shape* RECs) and, separately, since ICP will not be allowed to load *unbundled* RECs into its portfolio, ICP will have to purchase more expensive *bundled* energy in order to satisfy its 50% and 100% Green energy programs.

→ ICP's price structure and the economics of its overall program do not include the costs for the total required (net-new) bundled renewable energy for meeting its obligations.

→ ICP's Business contains one passing reference to "AB 1110" in one sentence. The reference contains no comment or insight. The reference may be located on page 68 of the Business Plan.

SCE Solar

With respect to WRCOG's (ICP) desired deployment of fifty 1 MW solar farms, it is worth noting that SCE currently offers a 100% solar program (local, located in-state). There is zero-cost to municipalities aside from the cost / KWh. When SCE opened its program there were approximately 270 MWs of solar available.

SCE's solar is available to individual cities that may desire to join ICP (WRCOG) in order to benefit from the promise of local solar deployment.

100% Solar Program: Alternate & Comparisons "Generation" price of monthly electric bill

SCE Residential Rate (Sch D)

	Program	\$ / KWh
ICP CCE	?	?
SCE	Green Rate	10.9¢
Marin Clean Energy	Local Sol	14.2¢

SCE General Service (Sch GS-1) (ave. Winter + Summer)

	Program	\$ / KWh
ICP CCE	?	?
SCE	Green Rate	11.5¢
Marin Clean Energy	Local Sol	14.2¢

SCE General Service (Sch GS-2) (ave. Winter + Summer)

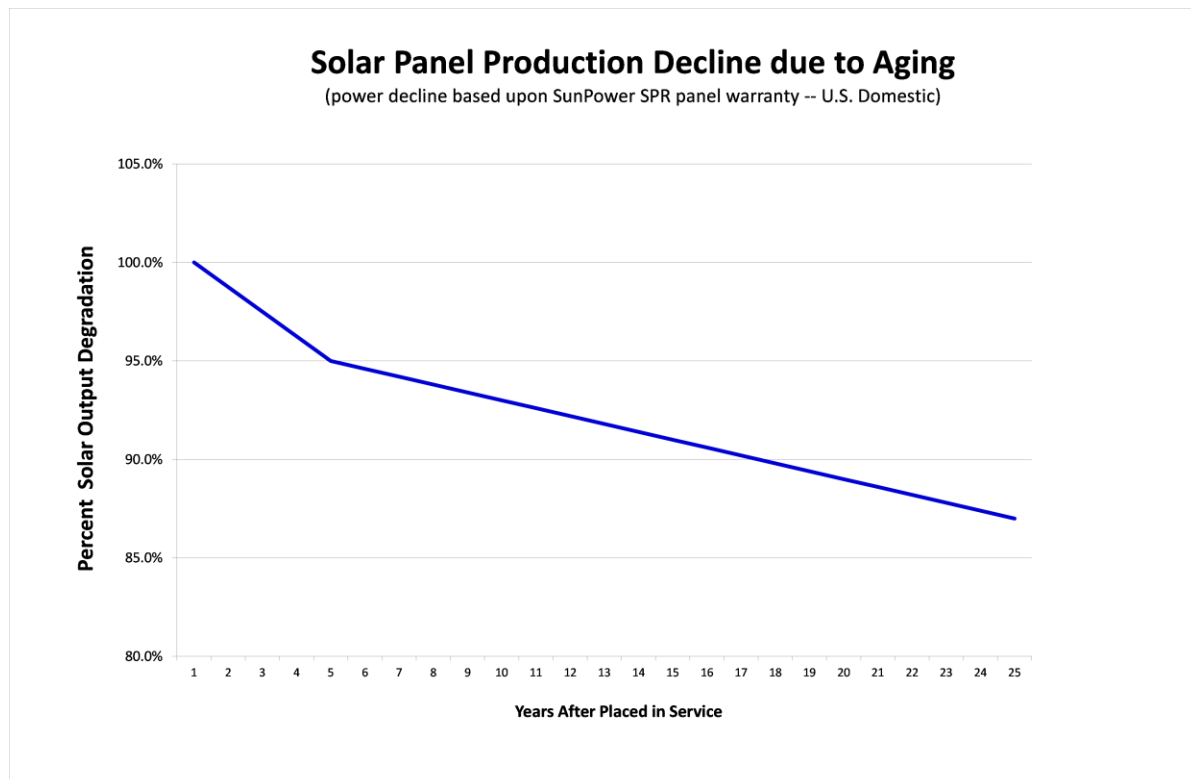
	Program	\$ / KWh
ICP CCE	?	?
SCE	Green Rate	8.4¢
Marin Clean Energy	Local Sol	14.2¢

WRCOG CCA

SCE's program is offered at a premium of 3.5¢ per KWh above the basic cost of SCE's conventional energy mix. Thus, when SCE's conventional energy mix cost increases, so would the "Green Rate" (aka "Community Renewables"). There is no liability or cost for adding replacement solar power that is lost as panels wear out, nor is there back-end disposal costs for discarding solar panels.

WRCOG's solar farms may be offered to consumers with rates that are fixed for extended periods, similar to what MCE offers for its "Local Sol" program. However, MCE's program contains no provision for how replacement power is added to the program due to solar farm output degradation and declines. Nor are there back-end disposal costs for the solar panels.

The table below shows the coincident percentage loss of energy output from SunPower photovoltaics, which are considered the gold-standard of solar panels. WRCOG must add the regular cost for replacement solar panels to make up for declining solar production.



FOOTNOTES

Footnote 1:

WRCOG ICP Business Plan:

<http://www.wrcog.cog.ca.us/AgendaCenter/ViewFile/Agenda/02062017-113>

(page 129)

Footnote 2:

1 MW Solar farm production: $1 \times 24 \text{ hrs} \times 365 \text{ days} \times 19\% \text{ capacity factor} = 1,664 \text{ MWh/yr}$.
MCE's San Rafael solar airport is .972 MW. MCE reported to the California Energy Commission the following annual energy volumes:

2013: 1,807 MWh

2014: 1,527 MWh

2015: 1,698 MWh

5,032 MWh

$5,032 / 3 = 1,677 \text{ MWh}$

Empiric Annual Capacity factor for MCE's .972 KW solar farm = $1,677 / 24 / 36 = 19\%$.

$1 \text{ MW} / .972 \text{ MW} = 1.029$. Therefore, actual megawatt-hour production from 1 MW solar farm = $1.029 \times 1,677 = 1,725 \text{ MWh per year}$.

50 solar farms x 1,725 = 86,250 MWh

WRCOG "RPS" financial proforma shows 5,605,514 MWh at full rollout.

$86,250 / 5,605,514 = 1.5\%$ of WRCOG CCA total energy load produced by 50 1 MW solar farms.

- Utility scale solar farm (100 MW) = \$1.49 / watt.
Assume no negative economy of scale: $\$1.49 \times 1,000,000 \text{ watts} = \1.5 million
- Utility scale solar farm (200 KW) = \$2.13 / watt
Assume no positive economy of scale: $\$2.13 \times 1,000,000 \text{ watts} = \2.13 million

→ Assume actual economy of scale = \$1.75 / watt

$\$1.75 \times 1,000,000 \text{ (x 50 solar farms)} = \87.5 million

<https://pv-magazine-usa.com/2016/09/29/nrel-u-s-utility-scale-solar-costs-fell-below-1-50-per-watt-in-q1-2016-with-charts/>