



Austin Energy

Summary of DNV KEMA Assessment for Local Solar in Austin

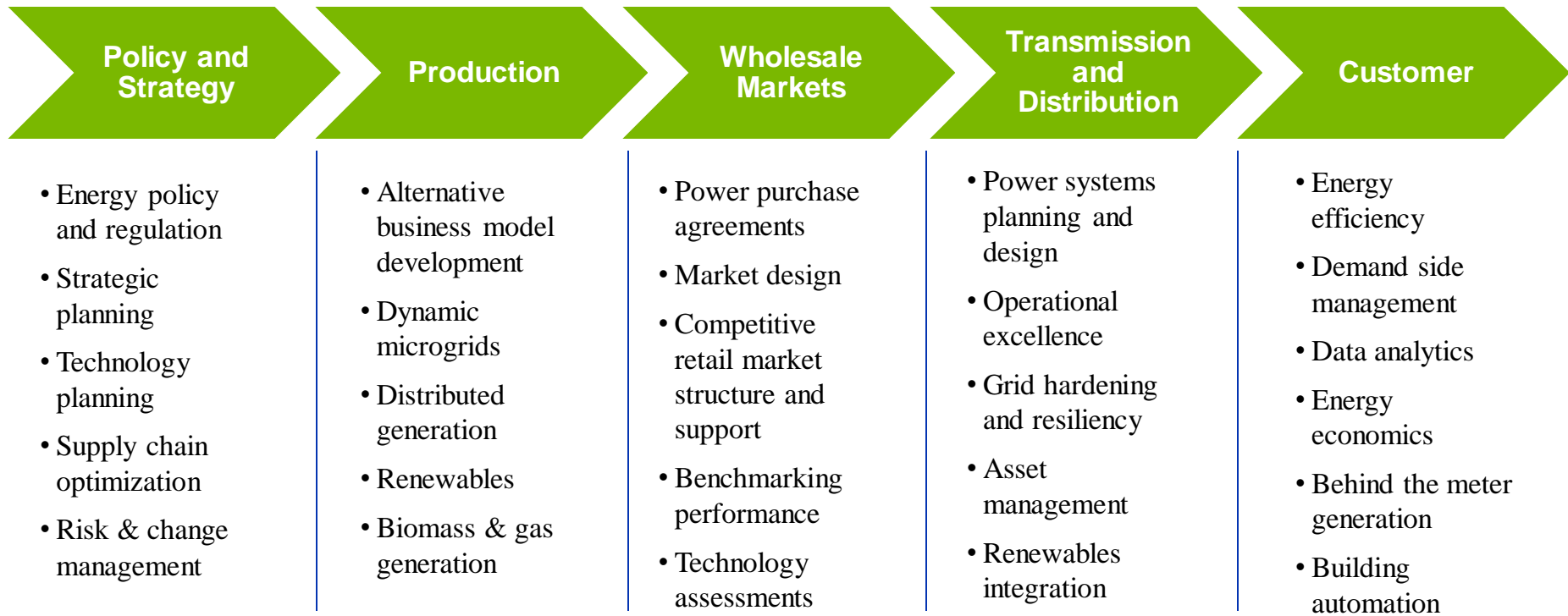
Final Report
October 17, 2013

DNV KEMA



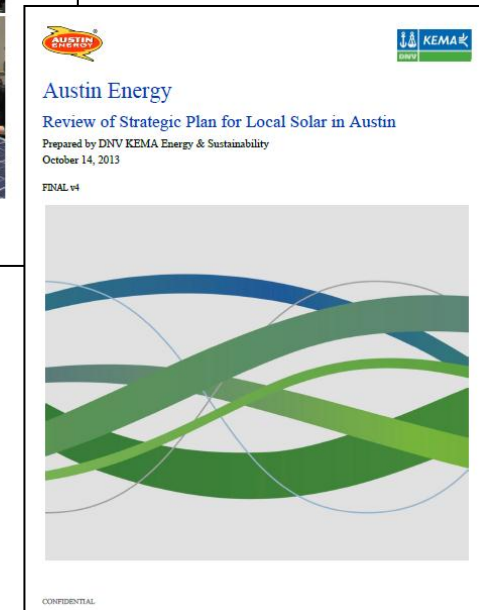
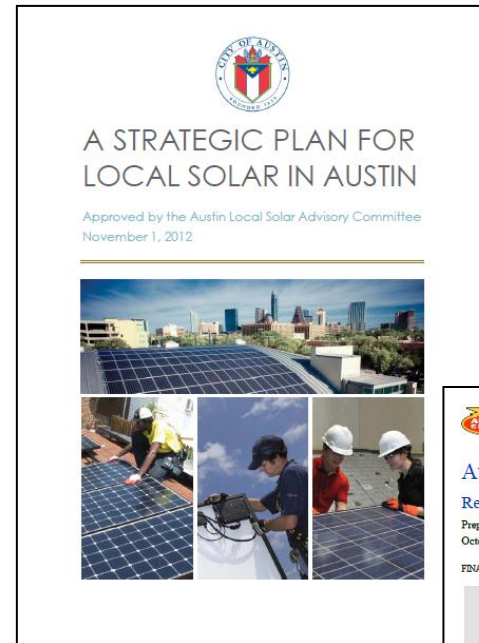
DNV KEMA – Introduction

Serving the Entire Energy Value Chain



Background and Scope

- The City of Austin's Local Solar Advisory Committee (LSAC) published its strategic plan for local solar in Austin on November 1, 2012. The plan advocates a 2020 solar goal of:
 - 100MW customer-sited solar
 - 100MW local utility-scale solar
 - 200MW other solar
- Austin Energy retained DNV KEMA to review the LSAC strategic plan, to confirm the plan's assumptions and methodologies, and to benchmark AE's solar goals against other utilities.
- DNV KEMA delivered its final assessment to Austin Energy October 14, 2013. This presentation summarizes the report's major findings.

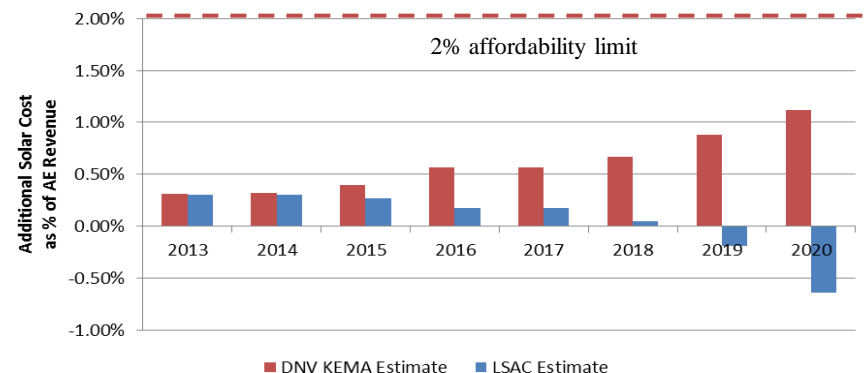


Executive Summary

- DNV KEMA's assessment confirmed many of the LSAC's technical assumptions such as:
 - Local solar resource potential
 - Customer-sited production factor
 - Projected decline of installed solar cost
 - Benefit of residential rebate phase-out
 - Benefit of from commercial PBI and resulting solar project scale
 - Benefit of accessible solar financing
- The assessment questioned the LSAC's net-cost methodology for quantifying Austin Energy's projected cost for solar:
 - LSAC subtracts the cost new natural gas generation (\$80/MWh increasing 2%/yr) from the projected solar cost to yield a net-cost
 - DNV KEMA suggests that a more accurate net-cost of solar is compared to the least cost alternative of meeting forecasted demand (\$44-50/MWh 2014-2020)
 - Least cost alternative assumption is from ERCOT South load zone daytime peak annual price forecast
 - This methodology change results in net-costs forecasts \$93 million higher than the 2013-2020 LSAC forecast*

*Assumes continuance of ITC continuance past 2016 per LSAC report

LSAC Scenarios			
	1	2	3
	Business as usual (200MW existing)	Meet demand growth (400MW)	Plant Replacement (600MW)
<u>Penetration Technical Feasibility</u>			
Customer	Feasible	Feasible	Feasible
Utility	Feasible	Uncertain	Uncertain
Other	NA	Feasible	Feasible
<u>Utility Cost Assumptions</u>			
Customer	Confirmed	Confirmed	Confirmed
Utility	Confirmed	Uncertain	Uncertain
Other	NA	Uncertain	Uncertain



Annual Solar Costs Forecast vs. 2% affordability limit 2013-2020

Customer-Sited Solar Assumptions

Residential		
Category	Assumption from LSAC Report	DNV KEMA Assessment
Installed Cost	\$3.90/Wdc with 6-7% Annual Decline	Reasonable
Production Factor	1,300 kWh/kWac	Conservative
Policy Impact	Did not address the impact from potential federal ITC changes in 2016	Optimistic

Commercial		
Category	Assumption from LSAC Report	DNV KEMA Assessment
Installed Cost	\$3.30/Wdc and 7%-14% annual decline	Slightly Optimistic
Production Factor	1,276 kWh/kWac	Conservative
Policy Impact	Did not address the impact from potential federal ITC changes in 2016	Optimistic

Utility-Scale Solar Assumptions

Local Utility-Scale		
Category	Assumption from LSAC Report	DNV KEMA Assessment
Solar Contract Cost	\$0.11/kWh to \$0.09/kWh	Reasonable
Production Factors	Steady production factor	Slightly Optimistic
Installed Costs	\$2.50/Watt for ground-mounted single-axis tracking	Slightly Conservative
Installed Costs	3% annual decrease in solar cost	Conservative

Other Utility-Scale		
Category	Assumption from LSAC Report	DNV KEMA Assessment
Solar Contract Cost	\$0.08/kWh to \$0.06/kWh	Reasonable*
Production Factor	2250 kWh/kWac	Conservative
DC-AC Conversion Factor	DC-AC Conversion factor of 0.90	Reasonable
Installed Costs	\$2.50/Watt for ground-mounted single-axis tracking	Slightly Conservative

*Assumes continuance of ITC past 2016. PPA contract costs below \$0.08/kWh may not be feasible for developers with installed costs of \$2.50/W or higher, especially without ITC continuance. See report section 3.1.4.

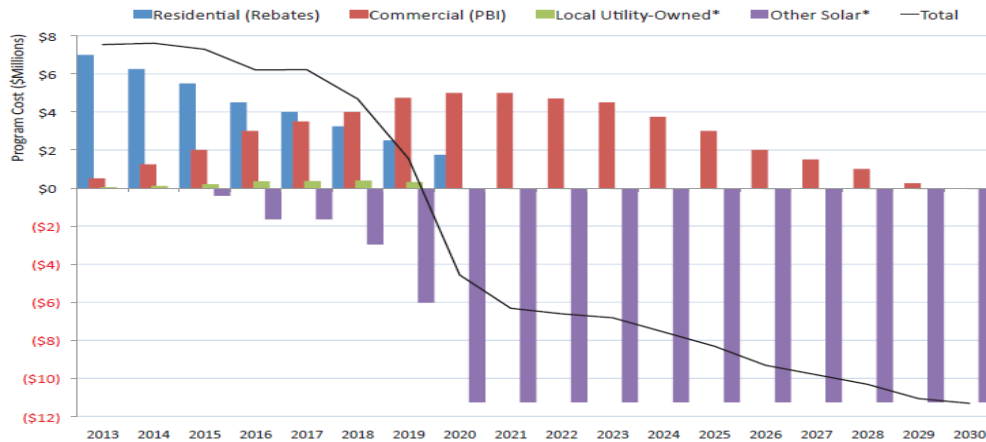
Solar Financing and Accessibility

- The DNV KEMA assessment confirms and expands on the LSAC's recommendation for innovative and accessible solar financing programs.

- Existing Programs
 - Residential capacity-based rebates
 - Value of Solar Credit
 - Velocity subsidized financing program

- Programs under consideration
 - SolarChoice: opt-in fuel charge replacement program
 - SolarShare: public solar portfolio program
 - Programs enabled by SB 385 Property Assessed Clean Energy Financing Program (PACE)

Utility Cost Impacts – LSAC Scenario 2 (400MW)



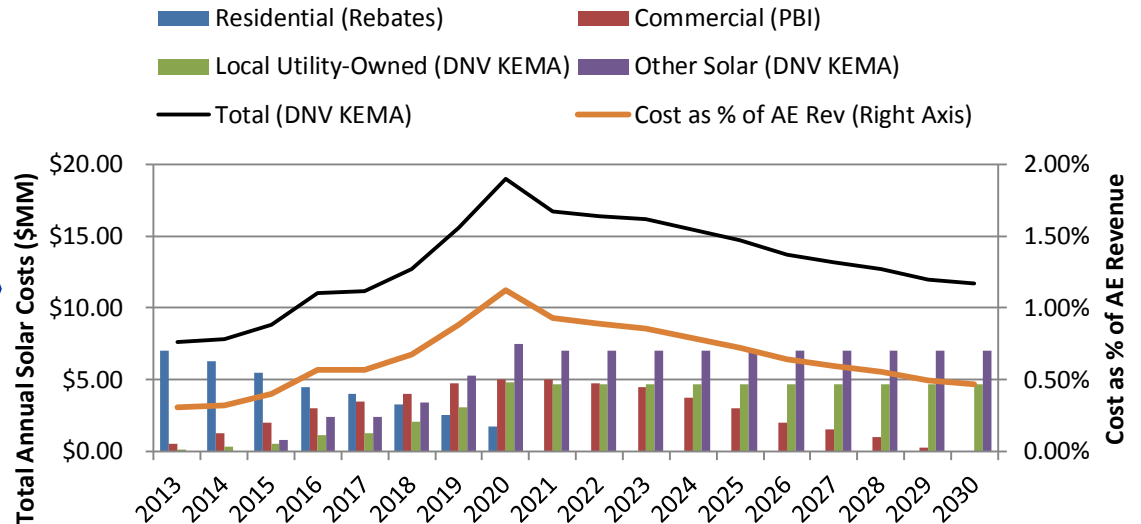
* Net solar cost versus new natural gas generation.

LSAC Solar Cost Forecast

- Predicts annual net savings starting in year 2020
- Assumes net-cost of solar that subtracts the cost of new gas-fired generation (\$80/MWh)

DNV KEMA Solar Cost Forecast

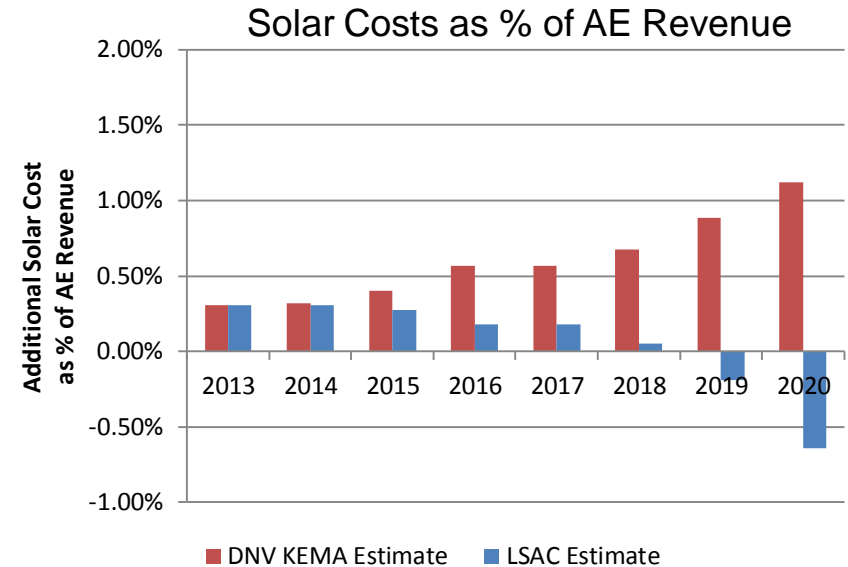
- Predicts peak costs in year 2020
- Highly dependent on ITC continuance past 2016
- Assumes net-cost of solar that subtracts the cost of ERCOT forward wholesale prices (\$45-50/MWh for ERCOT South Zone 5x16 2014-2020)



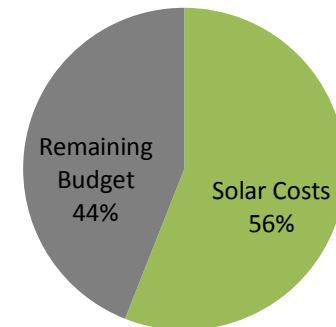
Note: Chart assumes ITC continuance past 2016

Utility Cost Continued

- The City of Austin has an affordability target that limits total utility cost increases to 2% of Austin Energy's revenue.
- The LSAC report forecasts a net savings to the utility as a result of the proposed solar initiatives.
- DNV KEMA suggests that with the methodology change described previously, actual cost increases from the solar initiatives could exceed 1% of revenues in 2020, over half of the utility's total affordability limit.



2020 DNV KEMA forecast of solar cost as fraction of 2% spending limit



Benchmarking – Austin Energy Peers

Muni	Location	Average 2011 Retail Price*	Customer Count	Annual Revenue (USD)	Peak Load (MW)
Austin Energy	Austin, Texas	\$0.1188/kWh...Res \$0.1031/kWh...Com \$0.0636/kWh...Ind \$0.0923/kWh...Total	417,865	1,200,000,000	2,714
LADWP	Los Angeles, California	\$0.1281/kWh...Res \$0.1275/kWh...Com \$0.1153/kWh...Ind \$0.1266/kWh...Total	1,461,521	3,099,260,000	6,000
CPS	San Antonio, Texas	\$0.0926/kWh...Res \$0.774/kWh...Com \$0.0657/kWh...Ind \$0.0838/kWh...Total	728,000	1,900,000,000	4,817
SMUD	Sacramento, California	\$0.1235/kWh...Res \$0.1360/kWh...Com \$0.1131/kWh...Ind \$0.1192/kWh...Total	529,695	1,293,000,000	3,400

*Average rates include both energy and demand charges where applicable. Source: Form EIA-861

Benchmarking – Solar Goals

Muni	State Renewable Portfolio Standards	Muni Renewable Goal	Current Muni Renewable Percentage
Austin Energy	5,880 MW by 2015 10,000 MW by 2025 Non-wind goal of 500 MW (Muni's and Coops may opt-in)	35% renewable energy by January 1, 2020 (200 MW Solar)	20% Renewable (35% by 2016, per AE EMO)
LADWP	20% by 2013 25% by 2016 33% by 2020 (Muni's must adopt their own) CA Solar Initiative offers \$0.2-\$0.3/Watt rebate	33% Renewable by 2020 25% by 2016 (280MW distributed solar goal per CA SB1 by 2017; No State solar RPS carve out)	19% Renewable
CPS	5,880 MW by 2015 10,000 MW by 2025 Non-wind goal of 500 MW (Muni's and Coops may opt-in)	20% Renewables capacity by 2020 (400MW of new solar planned)	11-13% Renewable
SMUD	20% by 2013 25% by 2016 33% by 2020 (Muni's must adopt their own) CA Solar Initiative offers \$0.2-\$0.3/Watt rebate	33% plus 4% from “Grenergy” [sic] by 2020 (125MW distributed solar goal per CA SB1 by 2017; No State solar RPS carve out)	27.7% Renewable

Benchmarking – Current Solar Capacity and Programs

Muni	Solar Capacity (MW)	Solar Capacity as Percent of Peak Load	Utility Solar Rates	Programs
Austin Energy	13.6 MW Distributed <u>31 MW Utility Scale</u> 44.6 MW Total	1.6%	\$0.128/kWh Value of Solar (Residential) \$0.12/kWh PBI (Commercial) \$1.50/Watt rebate	Residential rebates Commercial incentives Value of solar rate GreenChoice
LADWP	57 MW Distributed <u>11.6 MW Utility Scale</u> 68.6 MW Total 210 and 250 MW approved utility scale PPA	1.1%	\$0.17 to \$0.13/kWh FIT Separate capacity rebate also available which can be combined with net metering customer benefits.	Solar Incentive 150 MW FIT TOD rate
CPS	10 MW Distributed <u>45 MW Utility scale;</u> 55 MW Total 400 MW Utility scale in development	1.1%	\$0.056/kWh SunCredit (Discontinued) Net Metering Interim Solution \$1.60/W STEP rebate (Residential)	STEP incentive Net Metering (until alternative is defined)
SMUD	155.3 MW Distributed 2.3 MW Utility Scale <u>1.1 MW Community Solar</u> 158.7 MW total solar	4.4%	\$0.0756/kWh FIT 10 year \$0.0837/kWh FIT 15 year \$0.0923/kWh FIT 20 year. Separate capacity rebate also available which can be combined with net metering customer benefits.	Solar incentive SolarShares Community Solar FIT Program (Currently closed for new applicants) TOD rate

Conclusions

- DNV KEMA confirms many of the LSAC's most important assumptions and forecasted benefits, especially for local customer sited solar
- By comparison to its utility peers, Austin Energy has done well to achieve its current level of installed solar
 - This is especially notable compared to California-based peers which have higher avoided costs compared to solar
- Local economic development benefits from customer sited solar are evident and use reputable sources
- The utility cost implications warrant a closer look
 - Net cost of solar compared to new natural gas generation may not reflect the true avoided costs for Austin Energy
 - ITC assumptions may drive investment and timing decisions
 - Austin Energy intends to work with relevant stakeholders and staff to assess potential costs and savings associated with the committee's recommendations using various assumptions

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