

## WEATHER

**Is a reference case assumption of a warming trend in average temperature reasonable?**

Agree	Neutral	Disagree	Comments
6	0	0	

**If yes, is an assumption of +1°F by 2050 (i.e., 0.5°F every 20 years) reasonable?**

Agree	Neutral	Disagree	Comments
			Consensus that the assumption should be higher

**If not +1°F by 2050, what should it be?**

	Yes	No	Comments
Higher than +1°F			Consensus that the assumption should be higher
Lower than +1°F			

**What else could be considered?**

- Suggested sources for alternative warming trend assumptions
  - IPCC Report 2018, global (conservative) increase of 1.5°C by 2035-2052, have to review report to confirm total timeframe of the increase
  - City climate change commission provides sea level rise projection, which is based on an underlying temperature increase assumption
  - UH Sea Grant
- Range between highs/lows – will this change over time?
- Look at impact of increasing temperature correlated to PV production
- Humidity levels are important – more energy use, cooling equipment has to use more energy at higher humidity
- Wind/windspeed – strength, consistency of trade winds, declining number of trade wind days and strength of trade winds

## ELECTRIFICATION OF TRANSPORTATION (EoT)

The State of Hawaii is committed to reducing our islands' dependence on fossil fuels and the mayors of Honolulu, Maui, Hawaii, and Kauai counties jointly committed to transition to 100% renewable fuels in transportation by 2045.

**What are the drivers that are needed to support these goals by increasing EV adoption and reaching higher saturations of total light duty vehicles?**

Rank in order of 1=most influential to 8=least influential

No.	Driver	Ranking (1 to 8)		
1	Cost parity of an EV with a comparable conventional vehicle	1	2	1
2	Automakers developing more suitable models / variety in local dealer stock	6	6	6
3*	Increased charging opportunities	3	3	3
4	Higher level awareness and understanding of EVs	5	4	8
5	Lower cost of owning and maintaining	2	5	5
6	Financial or other incentives	4	7	4
7	Policy	7	8	7
8	Other: Range and Convenience		1	2

### Comments:

\*Increased charging opportunities: especially at home, appropriately placed locations

## What is the future market saturation of EVs as a percent of light duty vehicles?

Using the example of scenarios from the handout developed for the EoT Roadmap as a guide where the numbers 1 through 3 represent being **closer** to the:

1 = Low Case    2 = Reference Case    3 = High Case

Oahu	1	2	3	Comments
In the next 5 years (~ 2024)	1	1		
In about 10 years (~ 2030)	1	1		
By 2045	1	1		

Maui County	1	2	3	Comments
In the next 5 years (~ 2024)	1	1		
In about 10 years (~ 2030)	1	1		
By 2045	1	1		

Hawaii Island	1	2	3	Comments
In the next 5 years (~ 2024)	1	1		
In about 10 years (~ 2030)	1	1		
By 2045	1	1		

## What influences a customer's decision when to charge their vehicle?

1 = Very important      2 = Somewhat important      3 = Not important

Personally owned	1	2	3	Comments
When it fits their schedule	2	1		
<u>Location is convenient and a charger/outlet is available</u>	3			
• At home				
• At the workplace	1	1	1	
• Public charger		2	1	
• Elsewhere		1	2	
The cost to charge	1		1	Doesn't vary much, so not very influential as a result
When more range is needed regardless of price	1	1	1	

Commercial	1	2	3	Comments
When it fits the business' operations	2			
The cost to charge		2		Because cost doesn't vary much by location
Accessibility of a charger regardless of the cost to charge	2			

## DISTRIBUTED ENERGY RESOURCES (DER)

### What are the drivers for adoption?

- 1 – Very important in customer's decision making
- 2 – Possibly important in customer's decision making
- 3 – Not important in customer's decision making

Driver	1	2	3	Comments
PV and storage installed costs				
Tax credits / rebates / other incentives				Good for adoption, but can be bad when/if they go away Tax credits don't mean as much to every consumer
Program structure and/or rate design				Plays heavily in proposal development by the developer
Being able to have own power				

- These are all important because they interplay to affect pay off period, which is the driver
- Solar developers provide the price point based on these factors combined
- As cost comes down, tax credit impact reduces
- If you don't have a tax liability, don't benefit individually
- Studies show that tax credits can benefit all indirectly
- CBRE
  - Setting small program sizes can dampen build out
  - Cap is a spiraling problem
  - Need tariff programs that are simple to understand and big enough to stimulate the market
  - Pricing is complicated

### What are the barriers for customers?

1 – Not a barrier

2 – Possibly a barrier

3 – Major barrier

Residential	1	2	3	Comments
Lack of home ownership			6	
Shared roof space		6		
Low consumption/low bill				1-2: High consumption is a major driver
Low income	1		2	Recent data suggests less of a barrier; Experience interacting with low income consumers shows it is still a barrier.
Roof integrity				2-3: Old construction, poor construction is a common issue
Financing options				1-2: Lease, cash buy, loan options lessen this barrier
Lack of knowledge of savings/financing options				Consensus that this is a major barrier
Financial acumen				Consensus that this is a major barrier

Commercial	1	2	3	Comments
Lack of roof ownership				2-3
Limited space				1-2
Short lease on property				2-3
Financing options	X			
Makes business sense		X		
Building aesthetics / historical				1-2
Roof integrity				Less of a barrier than residential
Cultural		X		
Roof design		X		

- Townhome PV hard on Oahu, easier in Maui and Hawaii Counties
- If income is low, then saving means something
- Roof space, efficiency in W/sqft has gone up, which helps with this
- Residential customer education is poor
- Low incentive for rentals
- Business priorities are important factor/barrier
- Need entire policies and regulation process that incentivizes rather than blocking
- Grid constraints are another barrier

## What would it take to see major growth?

1 – Very important 2 – Possibly important

3 – Not important

	1	2	3	Comments
New technologies				
System prices				
New incentives / pricing				TOU is boring, e.g. utility give \$1000 toward BESS or free car charger
Tariff design/compensation for grid services				
Alt. energy storage technology with lower prices				
Tariff that is simple and attractive				

## What is the future market saturation?

1 – partially saturated, still room for growth

2 – nearing saturation, low growth

3 – fully saturated, no growth

	1	2	3	Comments
In 5-years	3			
In 10 years	2	1		Depends on incentives, alternatives
By 2045		1	1	Replacement construction and new technologies will still provide growth

- Cost assumptions – why not use other sources like NREL and GTM Research?
- Pricing
- Keep incentives simple, make them sexier
- Marketing innovation
- Partnerships – how to bundle things together to improve quality of life
- Internalization of cost of carbon
- Unlimited NEM
- Create market where whole value chain is winning
- Policies that line up incentives

**What happens to existing DER systems after they degrade or the lease ends?**

1 – Most Likely

2 – Unknown

3 – Unlikely

Residential	1	2	3	Comments
Replace	1			
Extend lease	1	1		
Nothing			1	
Remove			1	

Commercial	1	2	3	Comments
Replace	1			
Extend lease		1		
Nothing			1	
Remove			1	

- Hearing that legacy systems are being replaced with more efficient technology
- If original system was a cash purchase, then replace. If lease, then extend the lease