

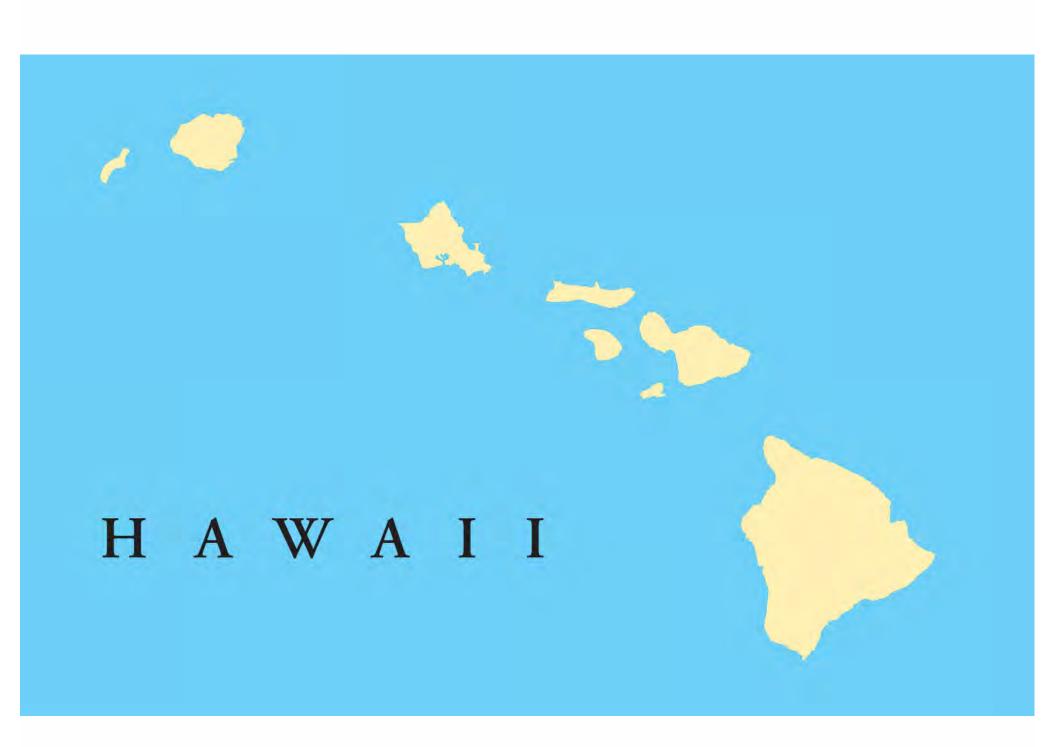
Hawaiian Electric Maui Electric Hawai'i Electric Light







Hawaii



































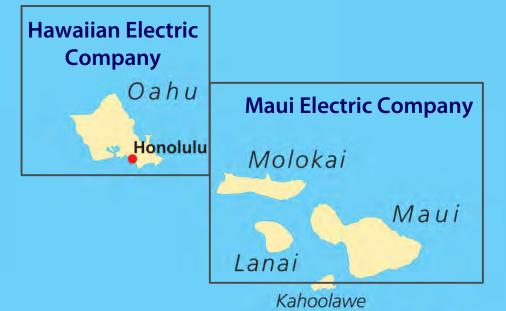




Molokai Maui Lanai Kahoolawe

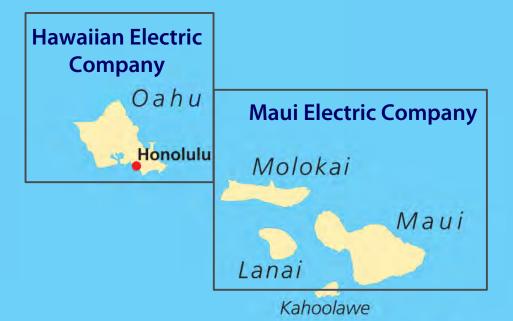






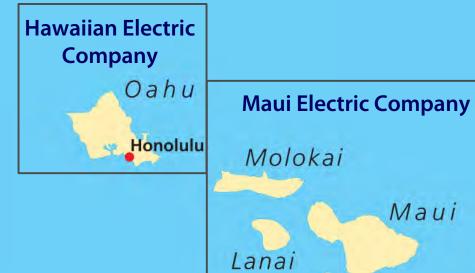












Kahoolawe







Hawaiian Electric Companies



Kahoolawe



	Firm MW -	⊦ RE MW	Firm RE MW	DG-PV
Hawaiian Electric	1,700	230	181	8.2%

	Firm MW	/ + RE MW	Firm RE MW	DG-PV
Hawaiian Electric				
**	1,700	230	181	8.2%
	50	28 + 8	8	(2017)

	Firm MW + RE MW		Firm RE MW	DG-PV
Hawaiian Electric	1,700 50	230 28 + 8	181 8	8.2% (2017)
Hawai'i Electric		165	38	10.8%

	Firm MW + RE MW		Firm RE MW	DG-PV
Hawaiian Electric	1,700 50	230 28 + 8	181 8	8.2% (2017)
Hawaiʻi Electric Light		165	38	10.8%
Maui Electric	278	116	0	10.7%

	Firm MW + RE MW		Firm RE MW	DG-PV
Hawaiian Electric				
***	1,700	230	181	8.2%
	50	28 + 8	8	(2017)
Hawaiʻi Electric Light		165	38	10.8%
Maui Electric	278	116	0	10.7%
	Lanai = 11 MW		Molokai = 15 MW	

Renewable Portfolio Standard

Milestone	2009 RPS	2015 RPS
2010	10%	
2015	15%	15%
2020	-	30%
2025	25%	1
2030	40%	40%
2040	_	70%
2045	_	100%

Renewable Portfolio Standard

Mileggone	200% RPS	_ 2015 RPS
29695	15 %%	15% –
29650	_15%	30% 15%
29895	25 %	_ 30%
29250	4025%	40% -
29390	_40%	70% 40%
29495		100% 70%
2045	_	100%

Year End	Attained RPS
2010	9.5%
2011	12.0%
2012	13.9%
2013	18.2%
2014	21.3%
2015	23.2%
2016	25.8%

Renewable Portfolio Standard

Milestone	200% RPS	_ 2015 RPS
29,695	15 %%	15%
29650	_15%	30% (15%)
29795	25 %	_ 30%
29250	4025%	40% -
29390	_40%	70% 40%
29495		100% 70%
2045	_	100%

Year End	Attained RPS
2010	9.5%
2011	12.0%
2012	13.9%
2013	18.2%
2014	21.3%
2015	23.2%
2016	25.8%

"Hawaii is the Silicon Valley of clean energy.

Hawaiian Electric has played a key role in building this reputation and encouraging innovation."

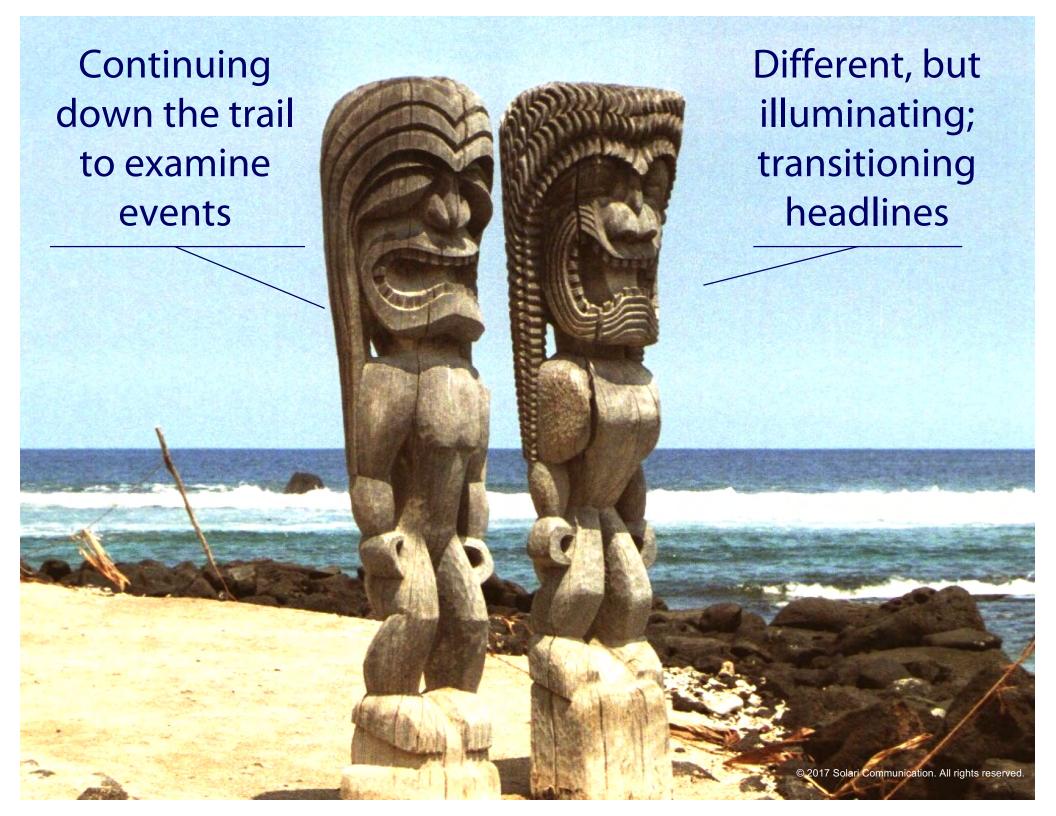
Brian Ryan, Vector Limited

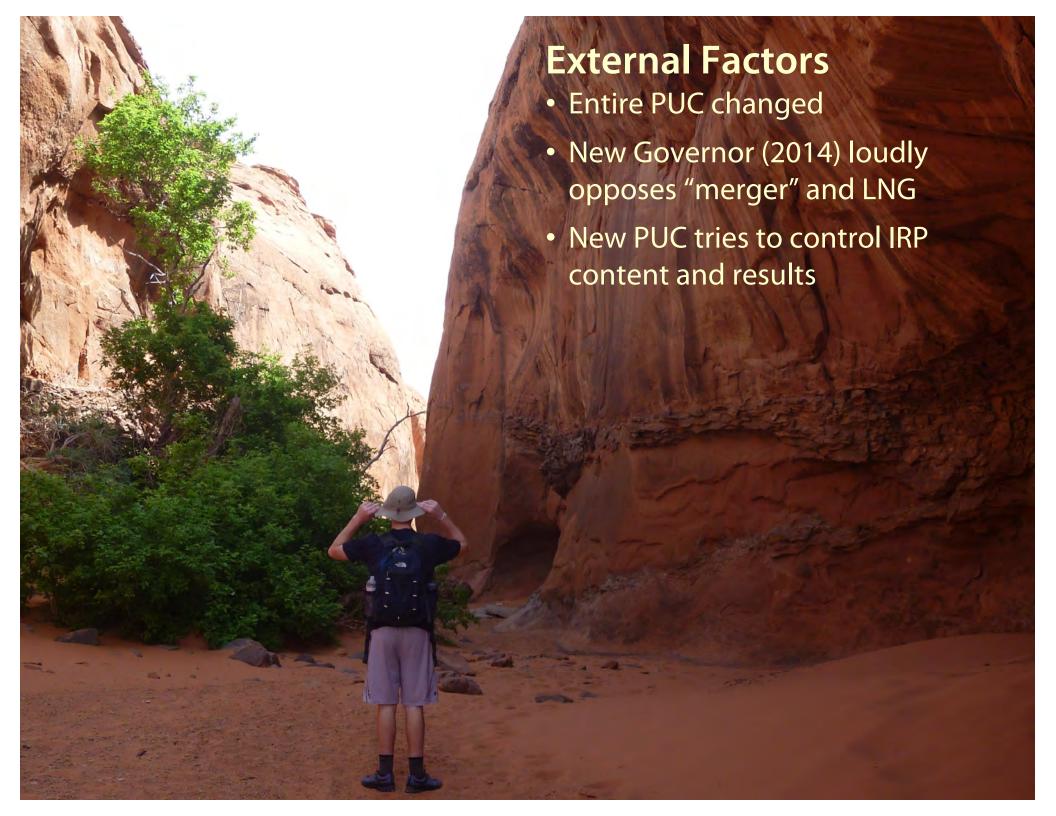
New Zealand Energy Excelerator Global Partner















Order announcing IRP 2013; with an updated IRP Framework



Order announcing IRP 2013; with an updated IRP Framework

Order starting IRP 2013

Mar

Order announcing IRP 2013; with an updated IRP Framework

2012

Mar

Order starting IRP 2013

IRP based on scenario planning; deadline = 365 days:

- Independent Entity & 68-person Advisory Board
- 17 Principal Issues
- Statute: 25% RPS by 2020; 40% RPS by 2030
- Twelve monthly AG meetings
- Seven additional unplanned technical sessions

Jun to...

Mar

Order announcing IRP 2013; with an updated IRP Framework

2012

Mar

Jun

to...

Order starting IRP 2013

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2013

Jun

IRP 2013 filed: exceeds RPS, modernizes the grid, adds LNG

2011 Mar

Order announcing IRP 2013; with an updated IRP Framework

2012

Mar

Order starting IRP 2013

order starting in 2013

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2013

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IRP 2013 filed: exceeds RPS, modernizes the grid, adds LNG

Jul

IE "cannot certify" IRP 2013

Jun to...

2011 Order announcing IRP 2013; with an updated IRP Framework Mar 2012 Mar Order starting IRP 2013 IRP based on scenario planning; deadline = 365 days: Independent Entity & 68-person Advisory Board 17 Principal Issues Jun • Statute: 25% RPS by 2020; 40% RPS by 2030 to... Twelve monthly AG meetings Seven additional unplanned technical sessions 2013 IRP 2013 filed: exceeds RPS, modernizes the grid, adds LNG Jun IE "cannot certify" IRP 2013 Jul 2014 IRP 2013 rejected (four months late); writes "Inclinations"

Apr

IRP: 2013

Comprehensive 42-page Executive Summary that followed past formats and outline

IRP casts a wide net: 752-page report (2,212 total)

Detailed every modeled resource plan (about 250)

Comprehensive discussion of results

Separate action plan for each utility

IRP: 2013 Assessment

- IE wouldn't certify; AG not fully considered;
 Framework not diligently followed; most Principal Issues not fully addressed
- Executive Summary too long; no clear headline
- No intermediate summaries
- Extremely technical
- Commission sought something different

[Executives wrote the Executive Summary following previous outlines; I wrote most everything else; more later]

PSIPs: 2014





HELCO PSIP ordered: 24 items in 4 Component Plans



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HELCO files PSP; never ruled on (both before IRP ruling)

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Anr

HELCO files PSP; never ruled on (both before IRP ruling)

Apr 21

HECO & MECO PSIPs ordered (37/7 & 21/4 Component Plans)

Apr 28

- Hawaiian Electric ordered to file four additional plans
- All plans: 120-day deadline

2013 Dec

HELCO PSIP ordered: 24 items in 4 Component Plans

2014

Apr 21

Apr

28

Aug

HELCO files PSP; never ruled on (both before IRP ruling)

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Three 2014 PSIPs filed; all exceed RPS mandates

- Transition to LNG; modernize the grid
- Reduce customer bills; respond to all Component Plans

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Apr 28

Aug

2015

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NextEra files "merger" application

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Mar	Order issued to address "merger" application
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2015	
Jan	NextEra files "merger" application
Mar	Order issued to address "merger" application
Sep	Over 27,000 pages of IR responses since Order issued
Nov	2014 PSIPs mostly rejected; update ordered

PSIPs: 2014

Brief 9-page Executive Summary with a headline: opening paragraph states the PSIP goal and high-level results

PSIPs pared down: 172-page report (412–711 total)

Little detail about modeling process

Focused discussion on results

Separate PSIP for each utility

PSIPs: 2014 Assessment

- Insufficient analysis—no surprise there
- Process not "transparent"
- Component Plans not fully addressed
- Financials considered deceptive (real dollars)
- Executive Summary on target; main headline clear
- Narrative becoming simpler
- Conclusions & Recommendations to the point

[I wrote the Executive Summary and most everything else that wasn't submitted last minute]



Updated April 2015 PSIPs ordered:

- Initial Statement of Issues & 8 Observations & Concerns
- Revision Plan, Interim PSIP, & Updated PSIP
- 22 intervenors rejected; admitted as participant "Parties"

Nov 4

Nov 25 Updated April 2015 PSIPs ordered:

- Initial Statement of Issues & 8 Observations & Concerns
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Revision Plan filed; conference schedule outlined

Nov 4

Nov 25

Dec

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Nov 25

Dec

2016

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2016

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2015 Nov 4 Nov 25 Dec 2016 Feb

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Revision Plan filed; conference schedule outlined

"Merger" hearings begin

Interim PSIP filed; new modeling of DER, DR, u-s RE unveiled

Mar

"Merger" hearings end; 7,200 transcript pages

Apr

Updated PSIP filed, work still to be done:

- Exceeds RPS mandates; addresses 7 of 8 O&Cs
- LNG as a transition fuel; 383 MW 3x1 CC
- Comprehensive grid transformation
- Oahu-based utility-scale wind and solar potential
- Results based on "merger" approval

PSIP: April 2016

Executive Summary (18 pages) focuses on the inclusive nature of attaining 100% renewable generation within 30 years in support of pending "merger"

PSIPs expanded: 284-page report (1,218 total)

Detail discussion about new modeling process

Comprehensive action plans for each utility

It's a plan;

subject to change as circumstances and assumptions change

PSIP: April 2016 Assessment

- Never ruled on because PSIP was incomplete, still...
- Too depended on "merger" approval
- LNG as transitional fuel a political issue
- 383 MW 3x1 CC a questionable direction
- Executive Summary a narrative supporting "merger"
- Main headline is clear, although soft
- Overall narrative simpler

[Executive & myself co-wrote the Executive Summary; again, I wrote most everything else that wasn't submitted last minute]





HNEI: Alt Ownership for Electric Utility on Oahu & Hawaii Island

2016
Apr
May
–Oct

HNEI: Alt Ownership for Electric Utility on Oahu & Hawaii Island

Several Party conferences & meetings held

2016
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May
-Oct

Jul

HNEI: Alt Ownership for Electric Utility on Oahu & Hawaii Island

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"Merger" dismissed without prejudice

2016	
Apr	HNEI: Alt Ownership for Electric Utility on Oahu & Hawaii Island
May –Oct	Several Party conferences & meetings held
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2	0	1	6

Apr

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Jul

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Hawaiian Electric Motion for Clarification: never ruled on

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Dec	 Updated Dec PSIP filed: 52% RPS by 2022; Molokai 100% RE by 2020 No LNG; maximizes DER; modernized the grid
2017	
Feb	Party and HECO SOPs filed. And the waiting begins

PSIP: December 2016

Executive Summary follows the pyramid structure

PSIP focused: 186-page report (1,962 total)

Attains 100% RPS in 2040, 5 years ahead of schedule

Detail discussion about a revised modeling process; uses three tools for duplicative analysis; all modeled resource plans detailed

One comprehensive action plan under One Company initiative

PSIP: December 2016 Assessment

- Executive Summary strongest yet
- Overall narrative much simpler
- Main headlines prominent
- Many chapter and appendix summaries
- Strong plan; realities exposed
- Awaiting decision…

[I wrote the Executive Summary, and most everything else that wasn't submitted last minute; more later]

"I don't view the utility as some kind of enemy to be castigated. We are all in one boat in Hawaii. We will sink or swim together. It doesn't help to demonize the utility. Some of our actions seem harsh, but we are following the rules and doing our job."

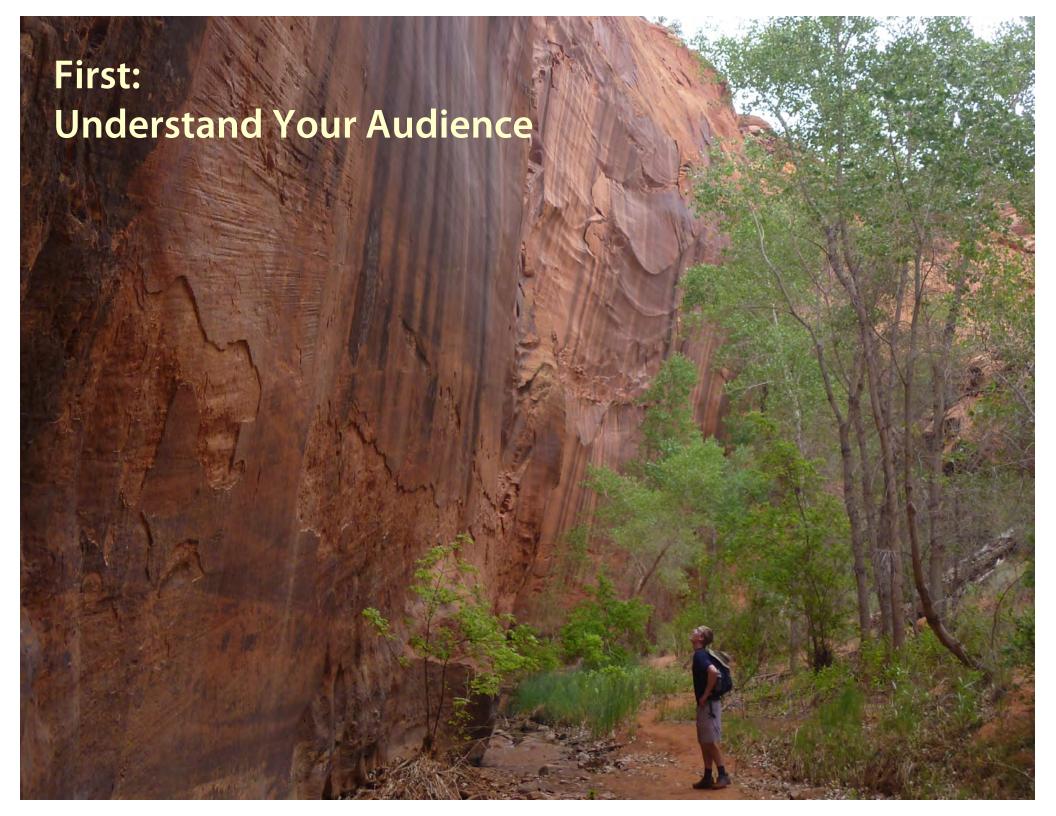
Randy Iwase, Chair Hawaii Public Utilities Commission



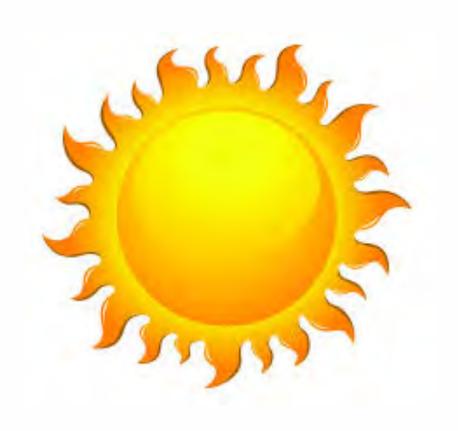




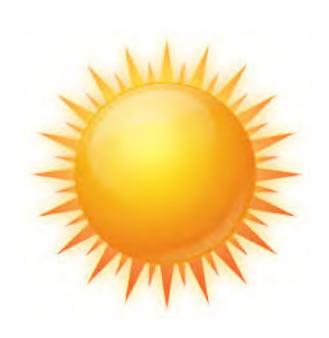




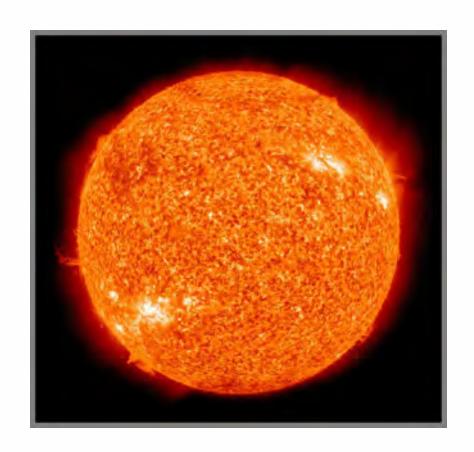
What is this?



And this?



And this?

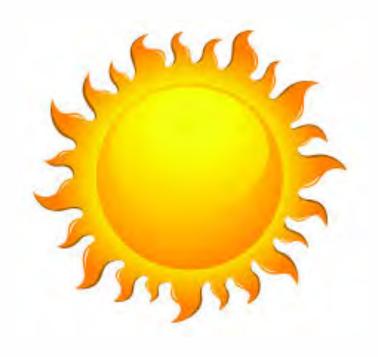


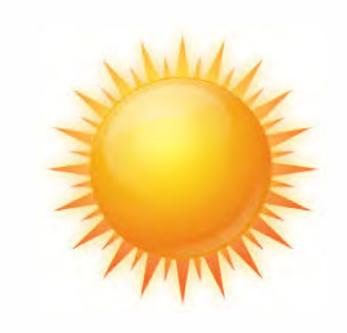
And this too?

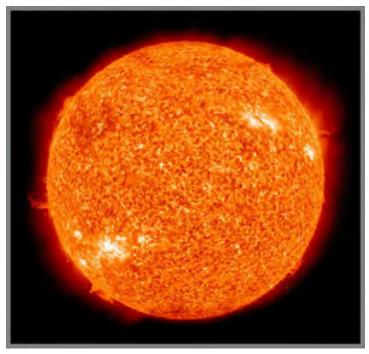


But are they really?

Actually, they are simply symbols



















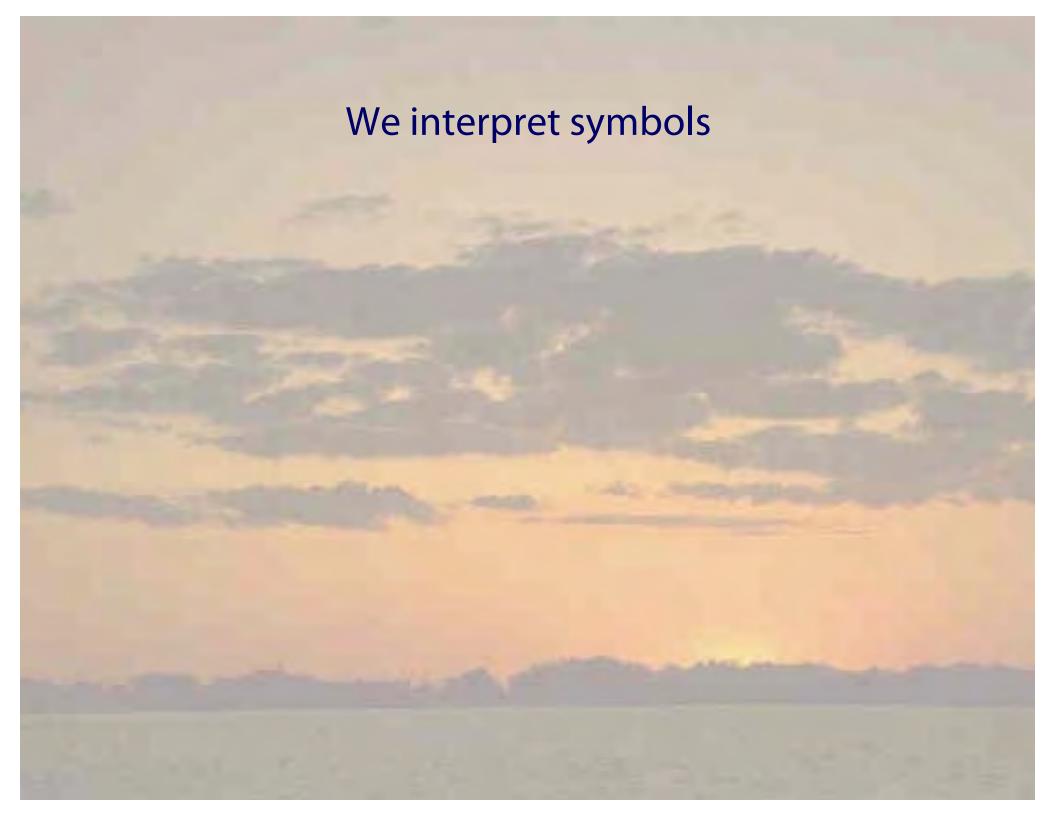


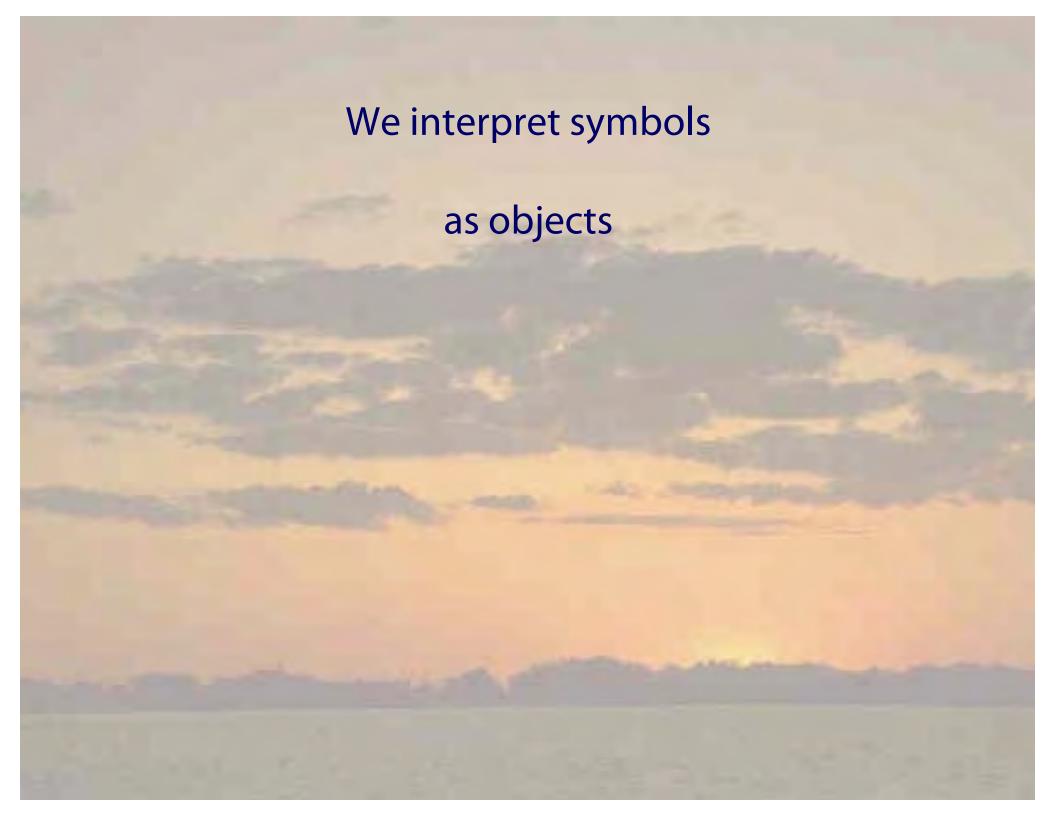








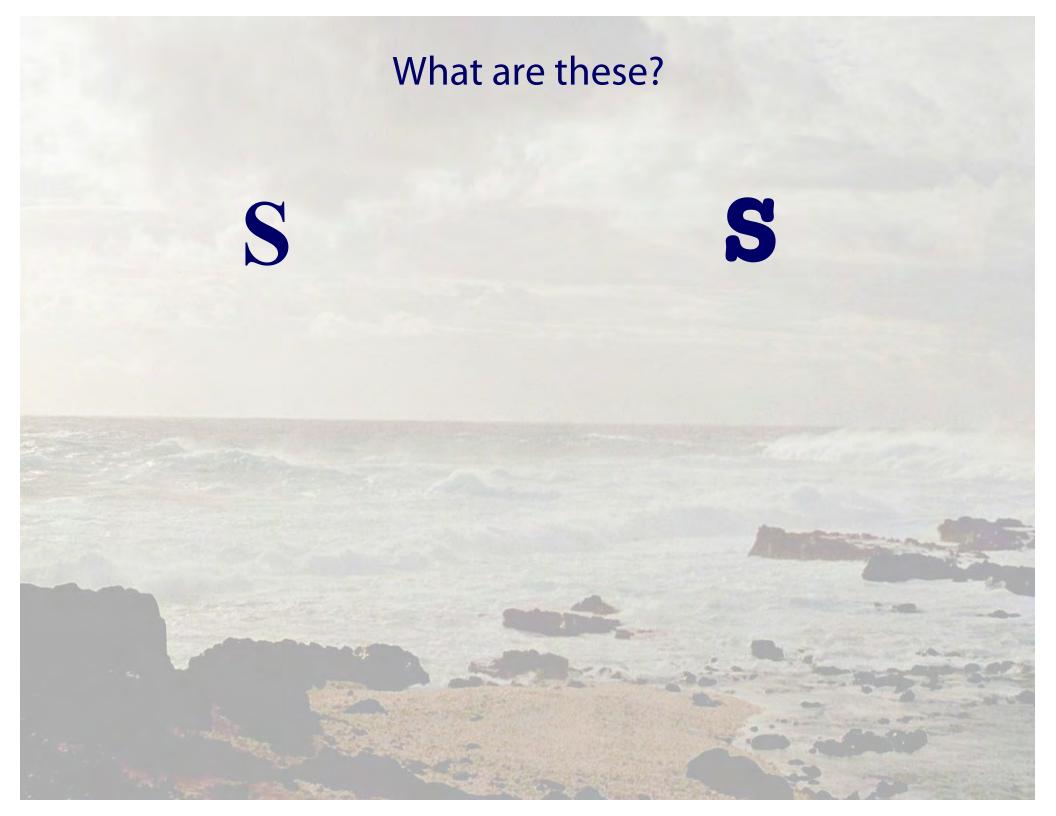


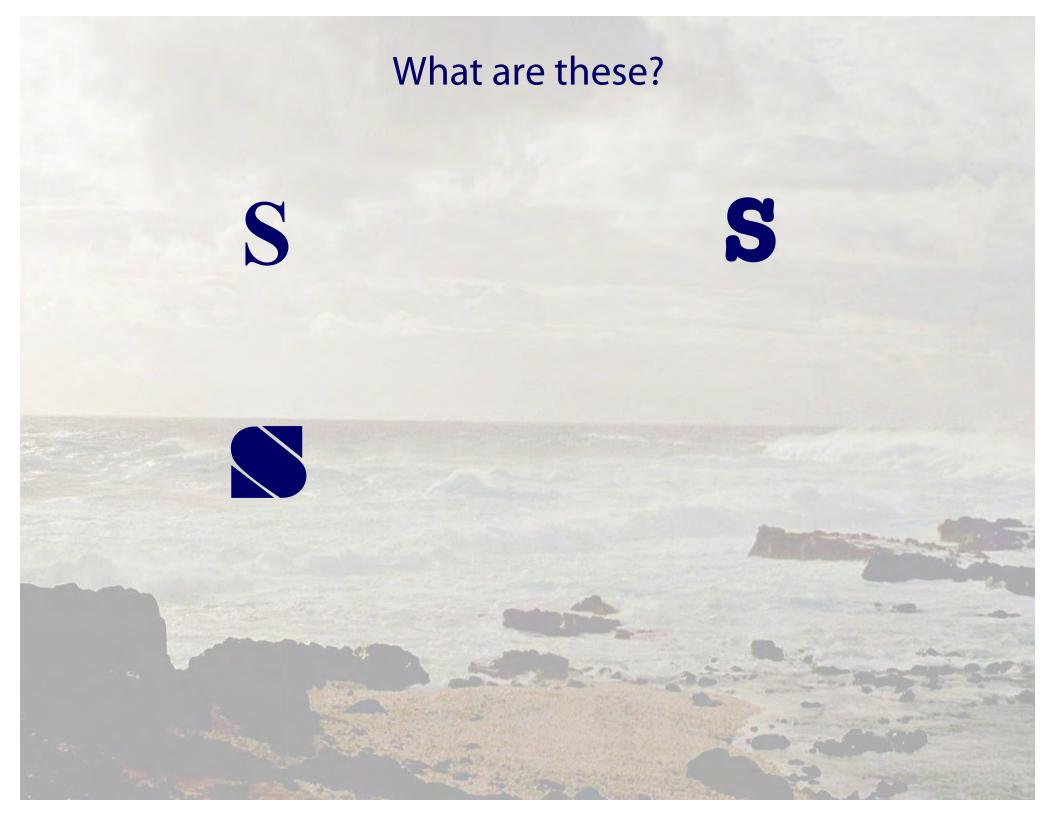


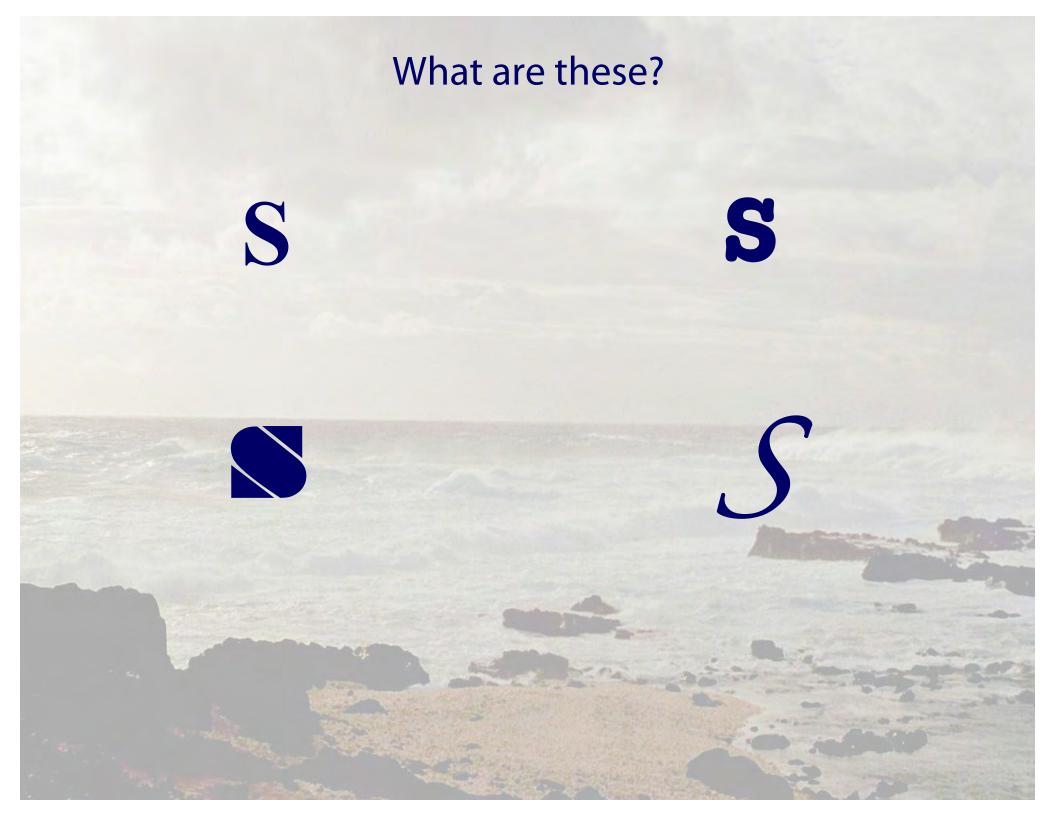
We interpret symbols as objects and as concepts





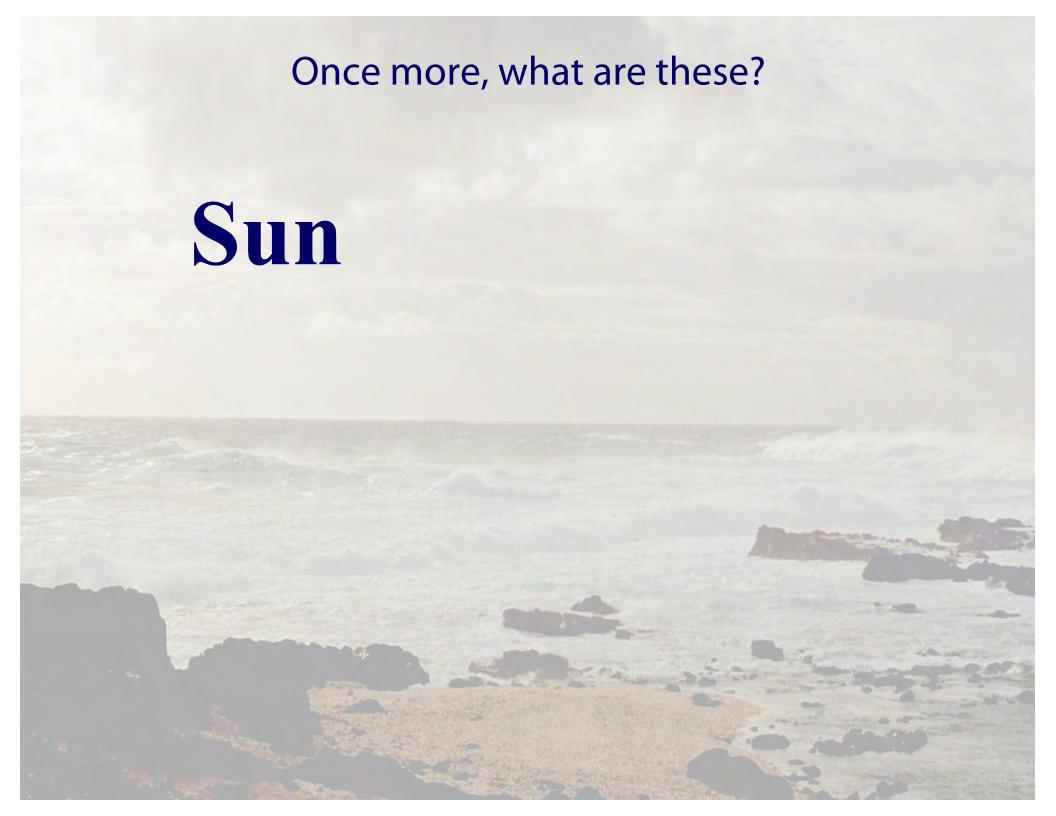














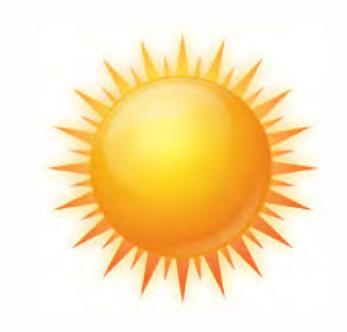


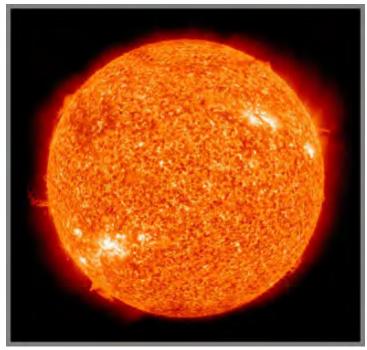




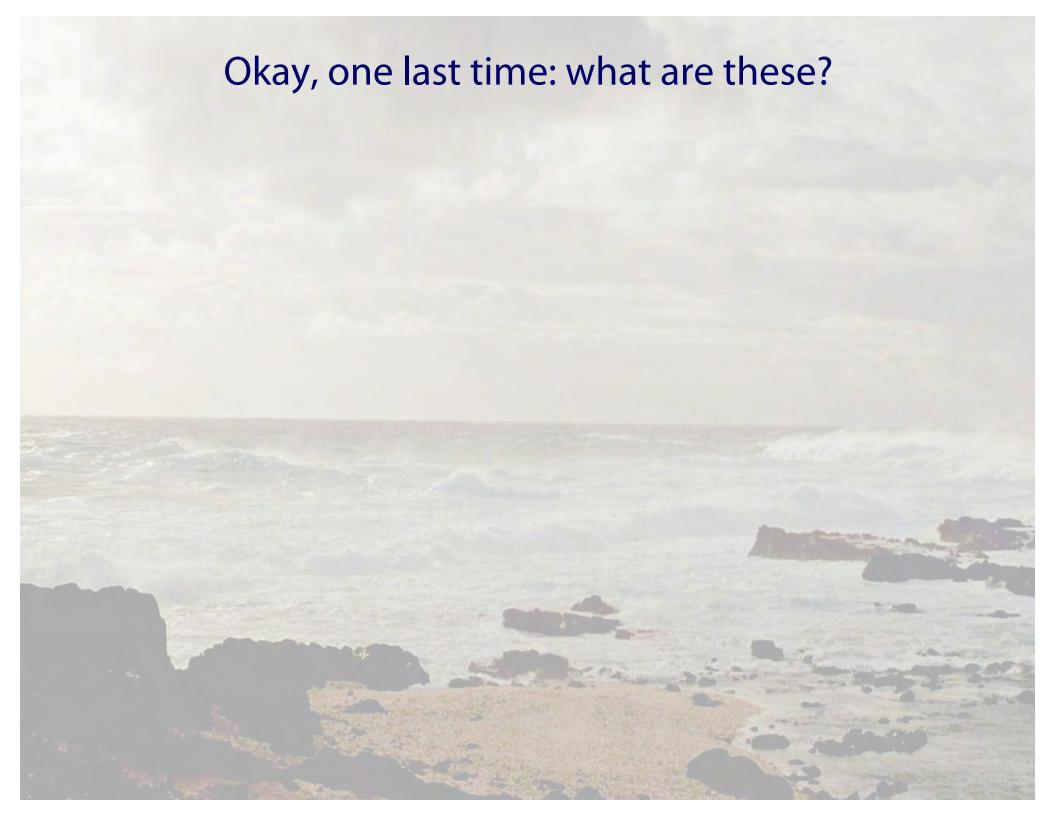
Just like these









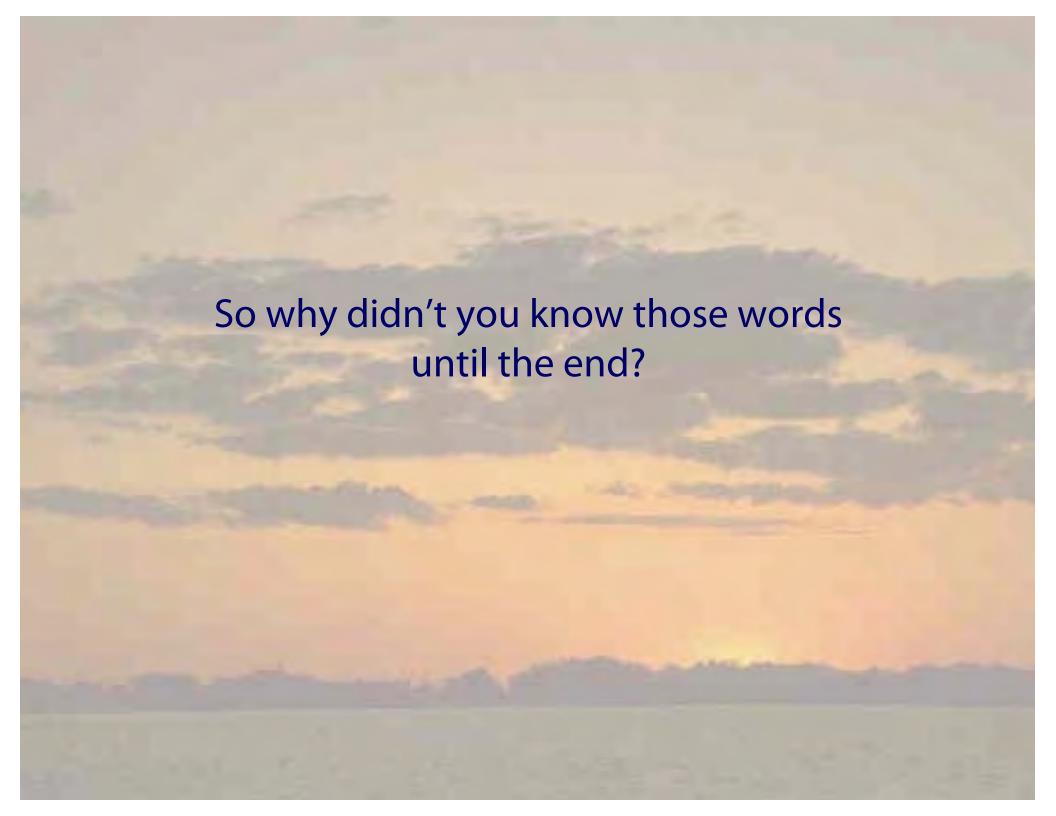


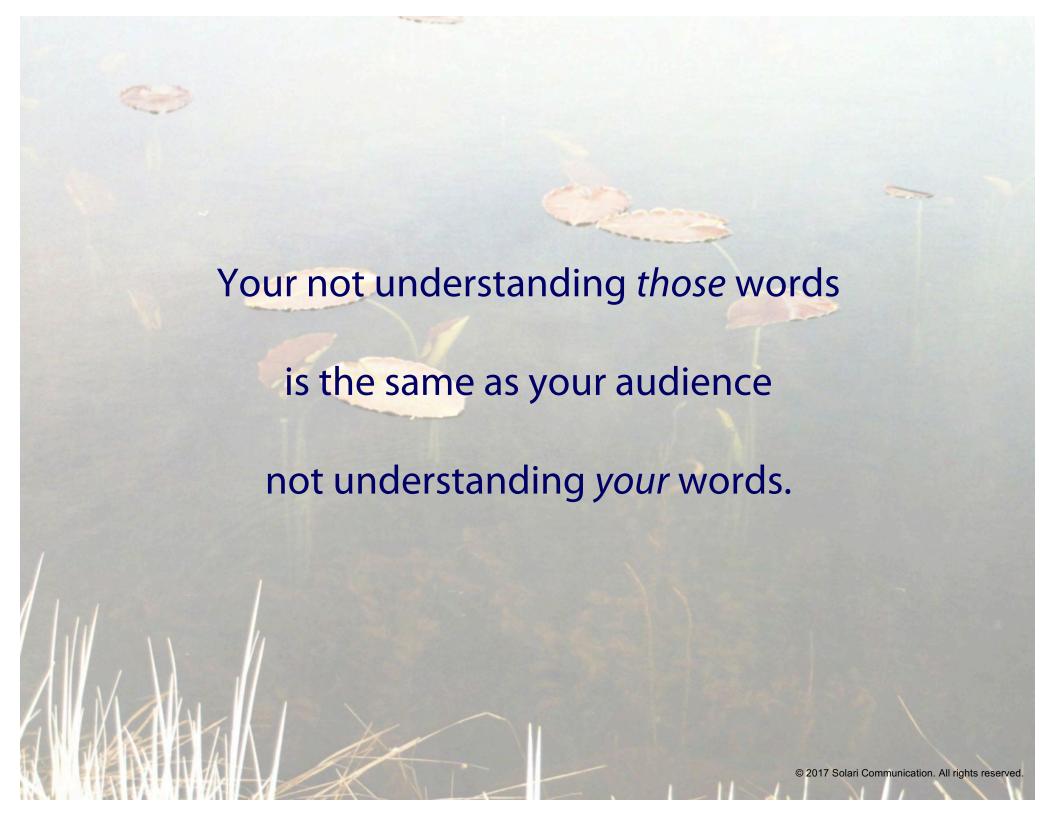


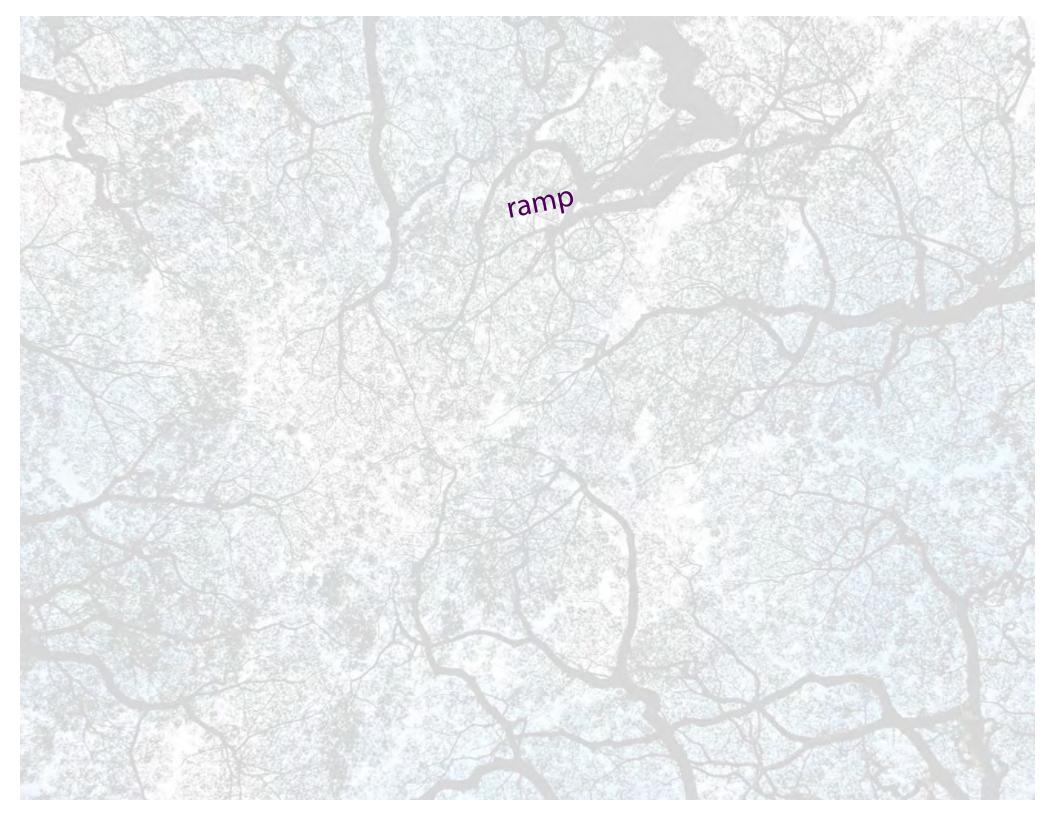








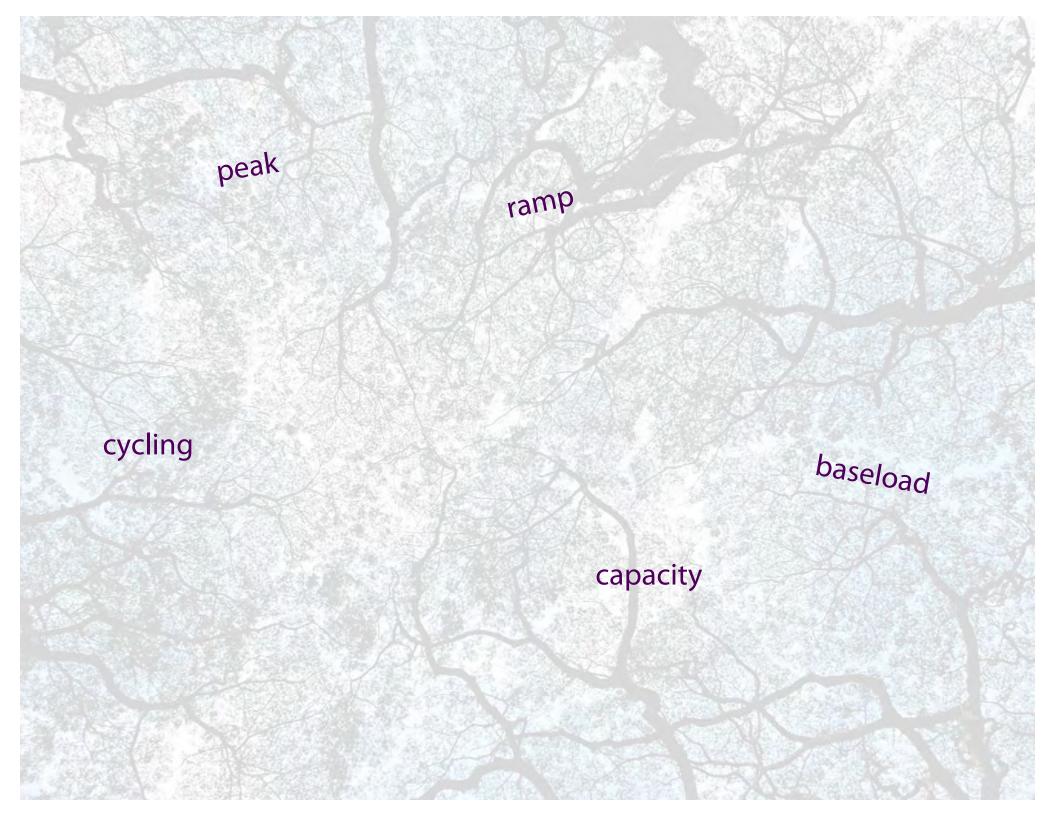


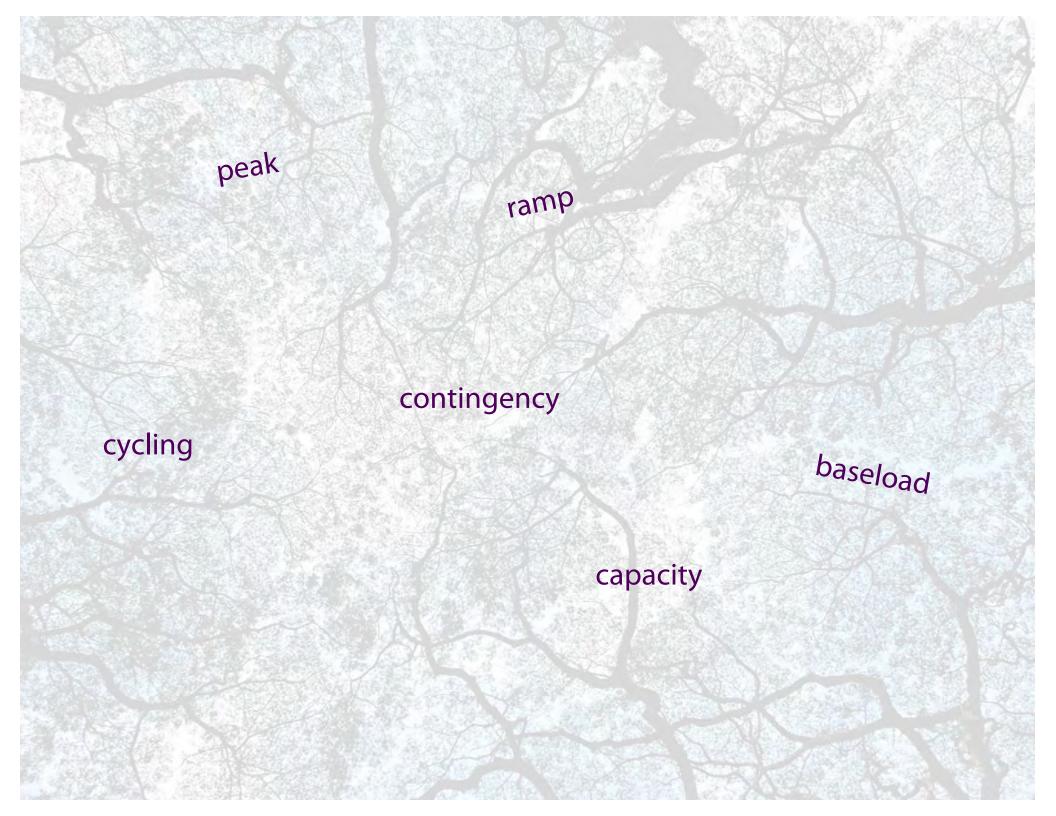


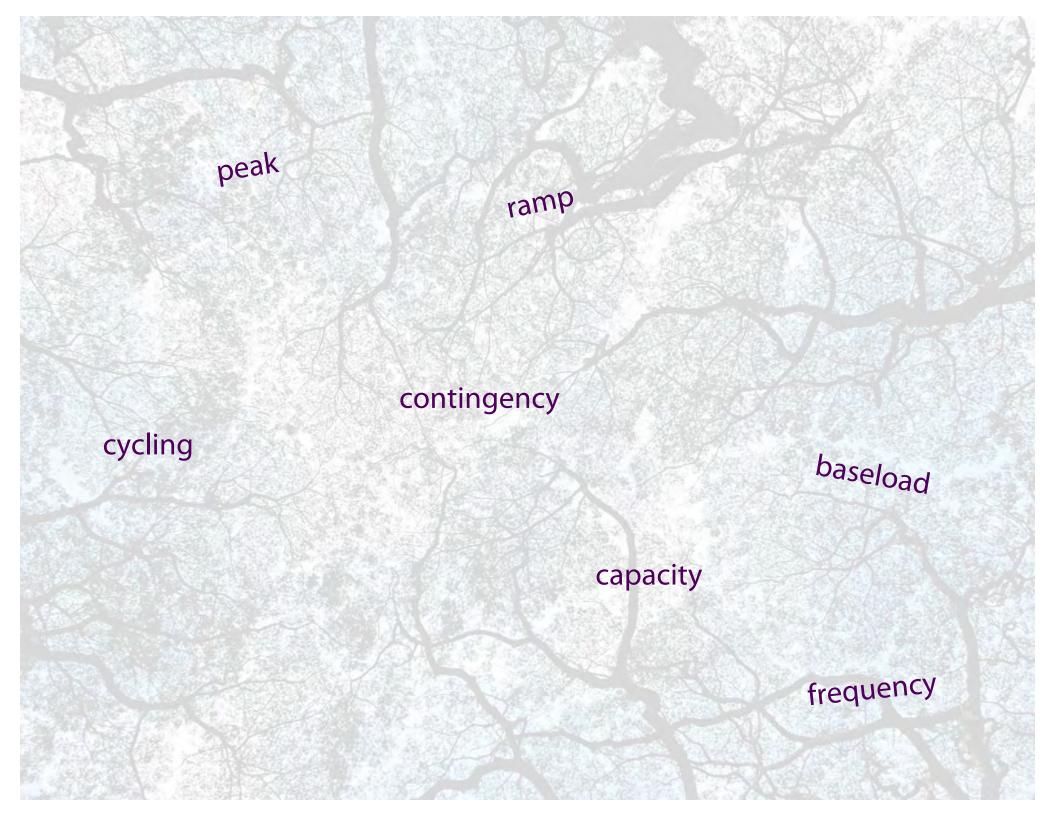


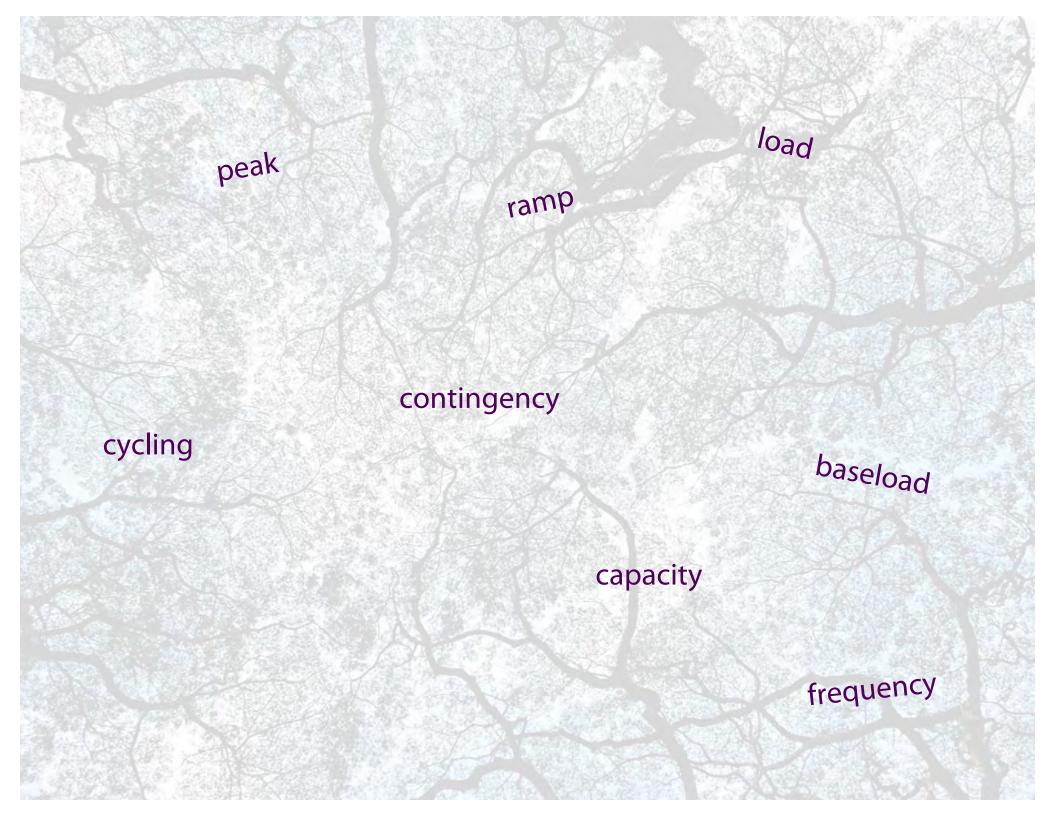


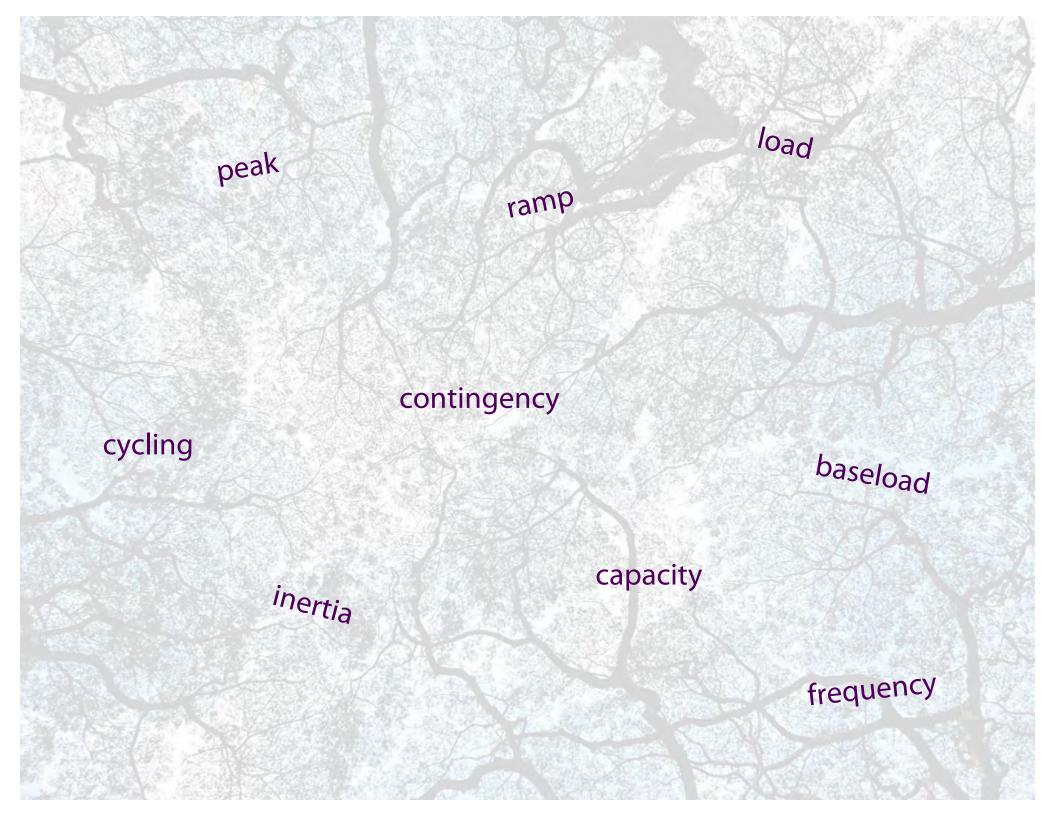




















So... How to define these words, and others like them? © 2017 Solari Communication. All rights reserved. So...

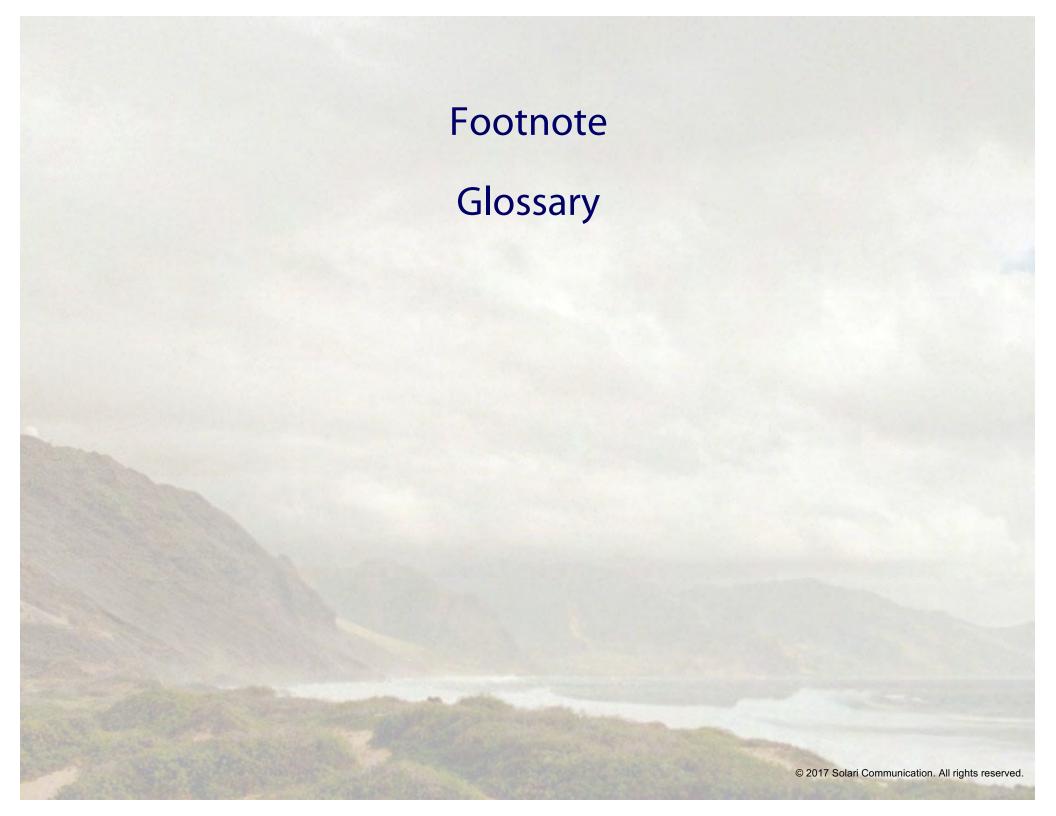
How to define these words, and others like them?

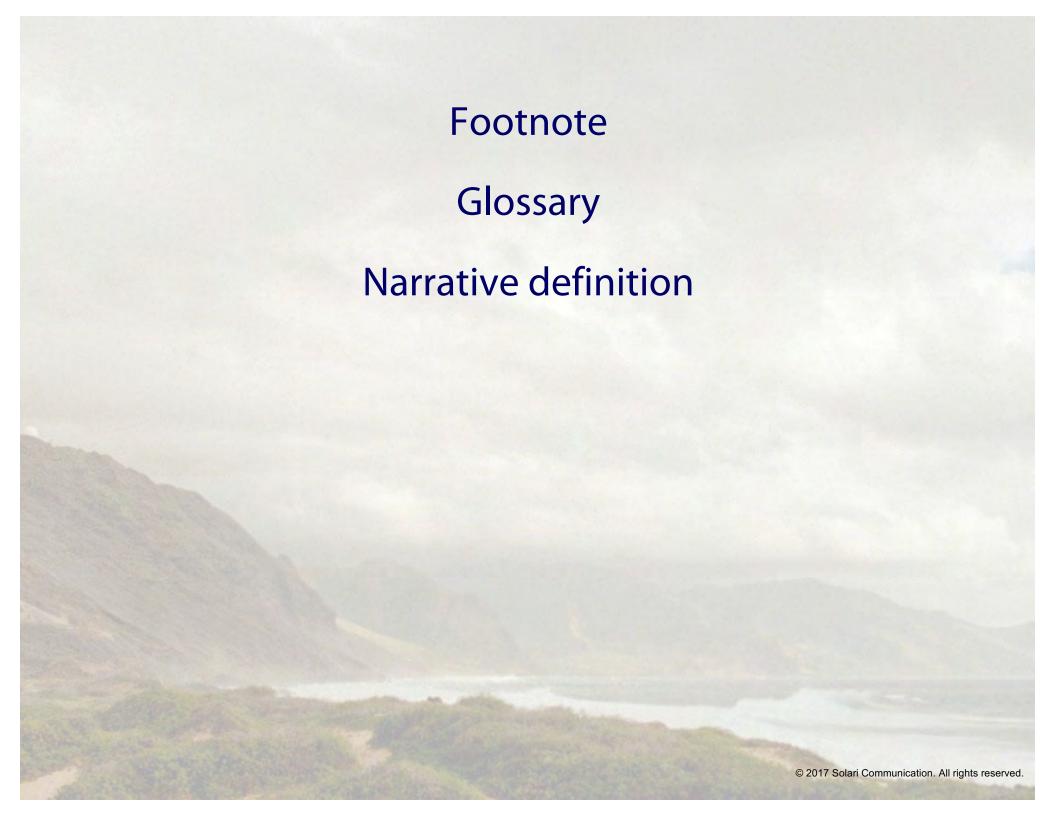
There are a number of solutions, each depends on your writing style guide

First, don't use different words

```
Ramp ≠ Increase
Contingency ≠ incident
```







Footnote
Glossary
Narrative definition
Narrative explanation

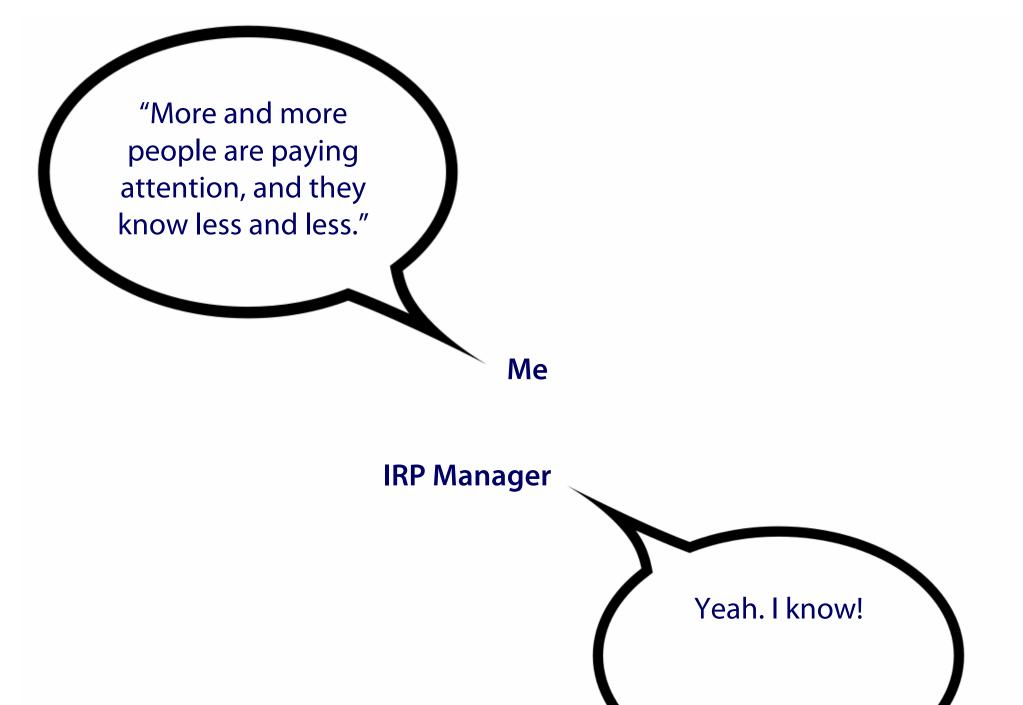
Narrative definition:

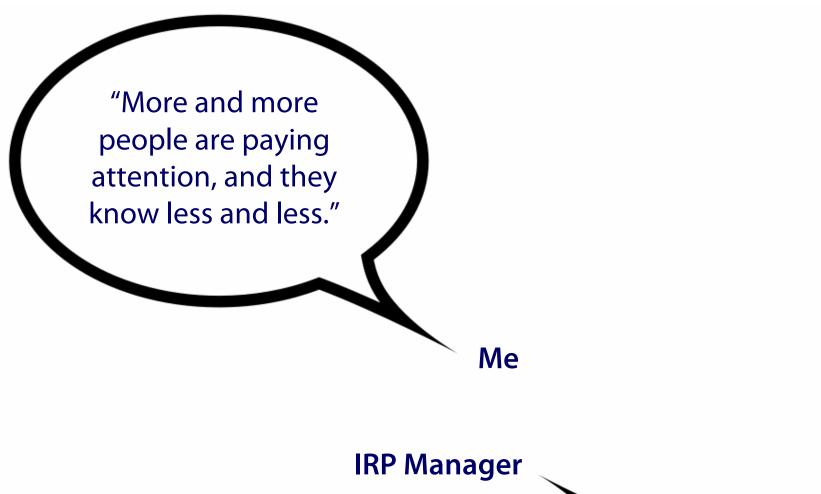
Ramp is the rate that a generator increases or decreases its power output, generally specified in MW per minute.

Narrative explanation:

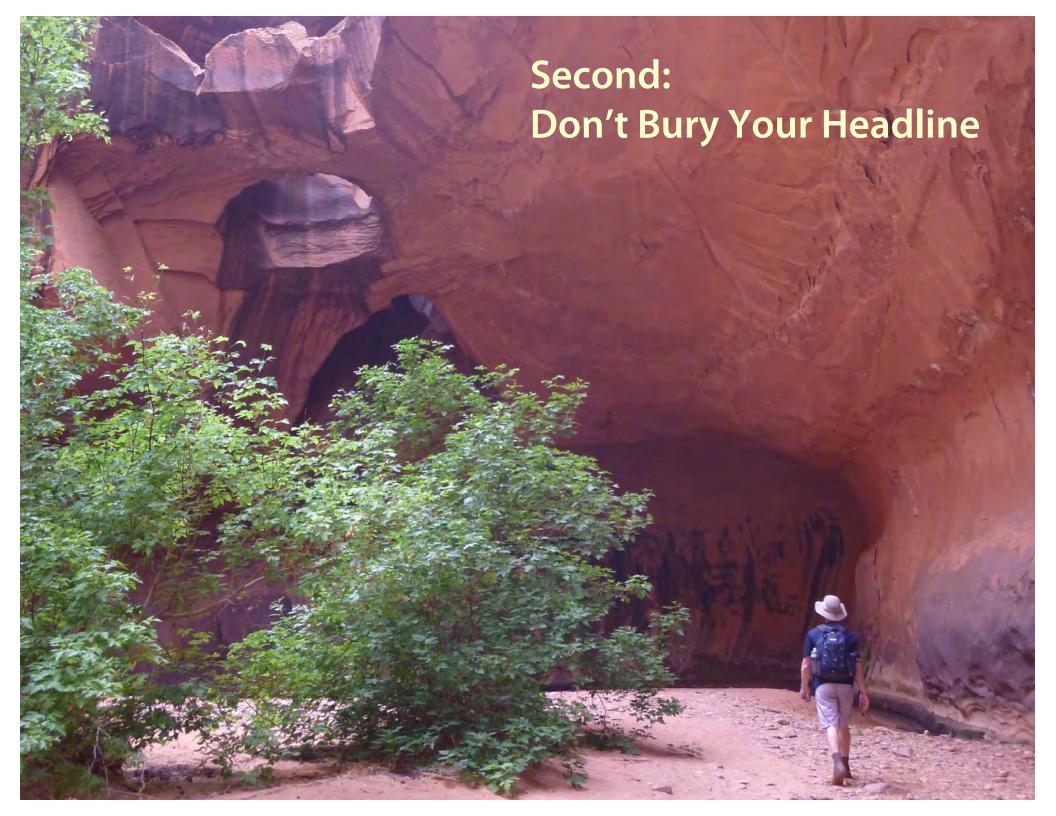
The fast-start generator ramped up to its full power output of 60 MW in only 4 minutes, achieving a ramp rate of 15 MW per minute.



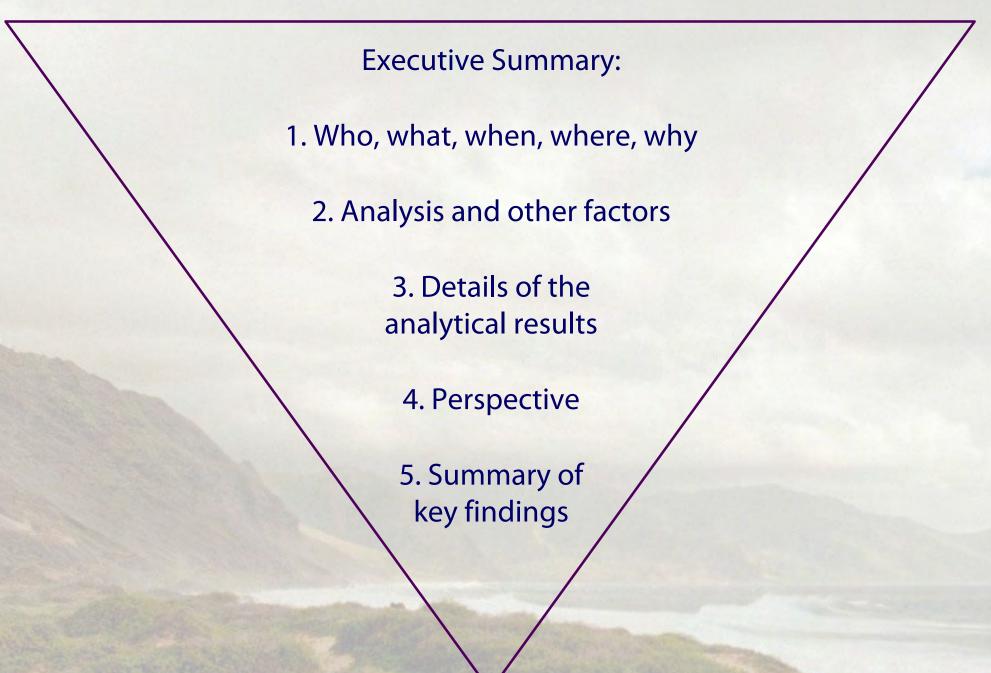








Typical Information Flow: Burying the Headline



Example: Burying the Headline

IRP 2013 Executive Summary

- Starts with the known and irrelevant
- First headline: page 7; IRP results: page 17
- Reader: "Where's the important information?"
- No overarching statement

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IRP 2013 Executive Summary

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- Reader: "Where's the important information?"
- No overarching statement

[btw, I didn't write this]

1. Who, what, when, where, why

Hawaiian Electric Company, Hawaii Electric Light Company, and Maui Electric Company [collectively referred to as the "Companies"] have developed the 2013 Integrated Resource Planning (IRP) Action Plan and report in cooperation with the Independent Entity (IE) and the Advisory Group (AG) established for this purpose by the Hawaii Public Utilities Commission (Commission) in accordance with the IRP Framework.¹ (page 1)

Problem: Irrelevant; already known

2. Analysis and other factors

The general goal of IRP is to develop an Action Plan that guides how the Companies will meet energy objectives and customer energy needs consistent with State of Hawaii energy policies and goals. The 2013 IRP Objectives were developed with the AG, and are presented below (followed by a bulleted list). (page 1)

Problem: Already known

3. Details of the analytical results

Historically, a traditional IRP would assess the new generation resource needs for a nominal 20-year planning period in a fullyregulated market with increasing demand for generation capacity. This is not the case in Hawaii today. Due to high fuel costs, effective energy efficiency programs, customer self-generation of electricity and economic conditions, utility sales and peak loads have declined for several years and are expected to be relatively flat (Stuck in the Middle IRP Scenario) or continue to decline (Blazing a Bold Frontier IRP Scenario) in the future. (page 1)

Problem: While important, it lacks context

4. Perspective

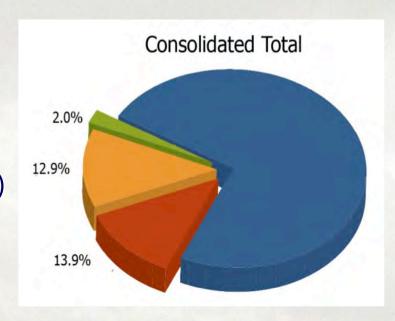
The Companies' goal is to better understand and respond to our customers' preferences and priorities. Our relationship with our customers begins in their homes and their businesses — helping them to conserve energy, to take advantage of energy efficiency and distributed generation options like PV, and to provide them the most information and the greatest control of their electricity use possible through tools such as smart meters and energy education. We also must continue to live up to our responsibility to ensure safe and reliable service for our customers' homes and businesses, in whatever manner and from whatever source our customers choose. (page 2)

Problem: Again, it's important, but not page 2 important.

5. Summary of key findings

The Companies met a record 13.9% of energy needs from renewable generation in 2012—well ahead of the 12% reported for 2011 & on the way to passing the next clean energy goal of 15% in 2015. (page 7)

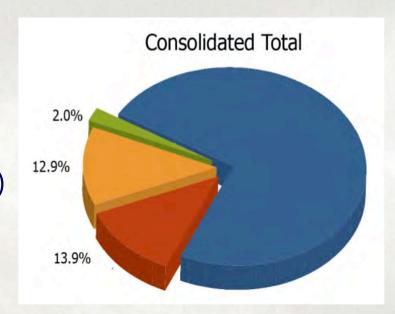
Problem: 7 pages to get to a headline



5. Summary of key findings

The Companies met a record 13.9% of energy needs from renewable generation in 2012—well ahead of the 12% reported for 2011 & on the way to passing the next clean energy goal of 15% in 2015. (page 7)





- Grid modernization (page 17)
- Costs and bills (page 22)
- Fairness (page 25)
- Scenarios, resource plans, and action plans (page 27)

Problems: Ten more pages before results; is it even obvious?

Addressing Audience Needs: Headline First



Addressing Audience Needs: Headline First



Example: Headline First

PSIP: December 2016 Executive Summary

- Hot item first: exceed RPS
- Actions that exceed RPS + summary details
- Reader gets important information in first 3 pages
- Overarching statement: attaining RPS doable
- That's headline first

Example: Headline First

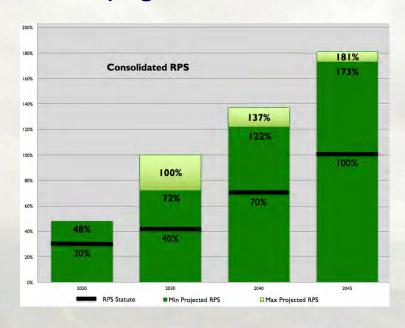
PSIP: December 2016 Executive Summary

- Hot item first: exceed RPS
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[btw, I did write this]

1. Summary of key findings

By implementing the proposed action plan, we will exceed the 2020 RPS mandate of 30%, achieving an estimated 48%, and doubling our 2016 RPS. Under multiple longer-term scenarios, our RPS can be at least 72% by 2030 and reach at least 100% by 2040, ahead of the 2045 deadline. (page 1)



2. Perspective

Our PSIP accelerates the pace on the path to 100% renewable energy. The Action Plans:

- Exceed Hawaii's 2020 Renewable Portfolio Standard (RPS) and achieve a consolidated RPS of 52% over the next five years.
- Enable Moloka'i to achieve 100% renewable energy by 2020.
- Maximize distributed energy resources—fairly compensated.
- Make high use of demand response programs.
- Aggressively seek grid-scale renewable resources, leveraging federal tax credits.
- Pursue grid modernization to enable continued integration of renewable energy.
- Preserve long-term flexibility to use emerging technologies and accommodate changing circumstances.
- Reduce operations that use fossil fuels and contribute to global warming. (page 2)

3. Details of the analytical results

Here are the renewable generation and customer demand response additions in our proposed nearterm action plans. (page 3)



3. Details of the analytical results

Here are the renewable generation and customer demand response additions in our proposed nearterm action plans. (page 3)



- Seven renewable energy planning principles (page 4)
- Strong DER growth (page 4)
- Grid modernization; costs (page 5)
- Interisland transmission (page 6)

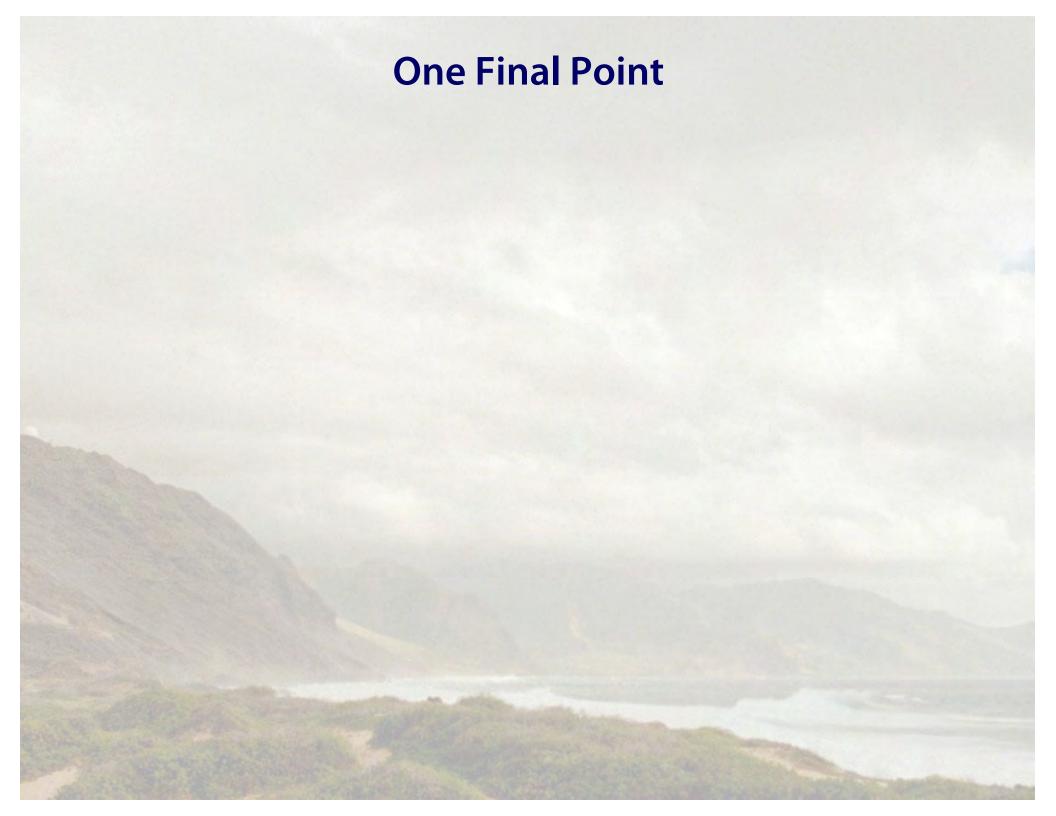
4. Analysis and other factors

Stakeholder Involvement. We analyzed many scenarios and strategies for attaining our RPS goals. These scenarios included multiple long-term energy scenarios developed by Hawaiian Electric and by PSIP stakeholders. As part of this evaluation, we collaborated with PSIP stakeholders, thoughtfully considering their suggestions and input. Here is a sampling of scenarios from several stakeholders along with our general assessment of those scenarios: (page 7)

[followed by a list of specific input topics]

5. Who, what, when, where, why

[omitted]



One Final Point

The technical trail is fundamental to resource plans

One Final Point

The technical trail is fundamental to resource plans

The communication trail is also fundamental to resource plans

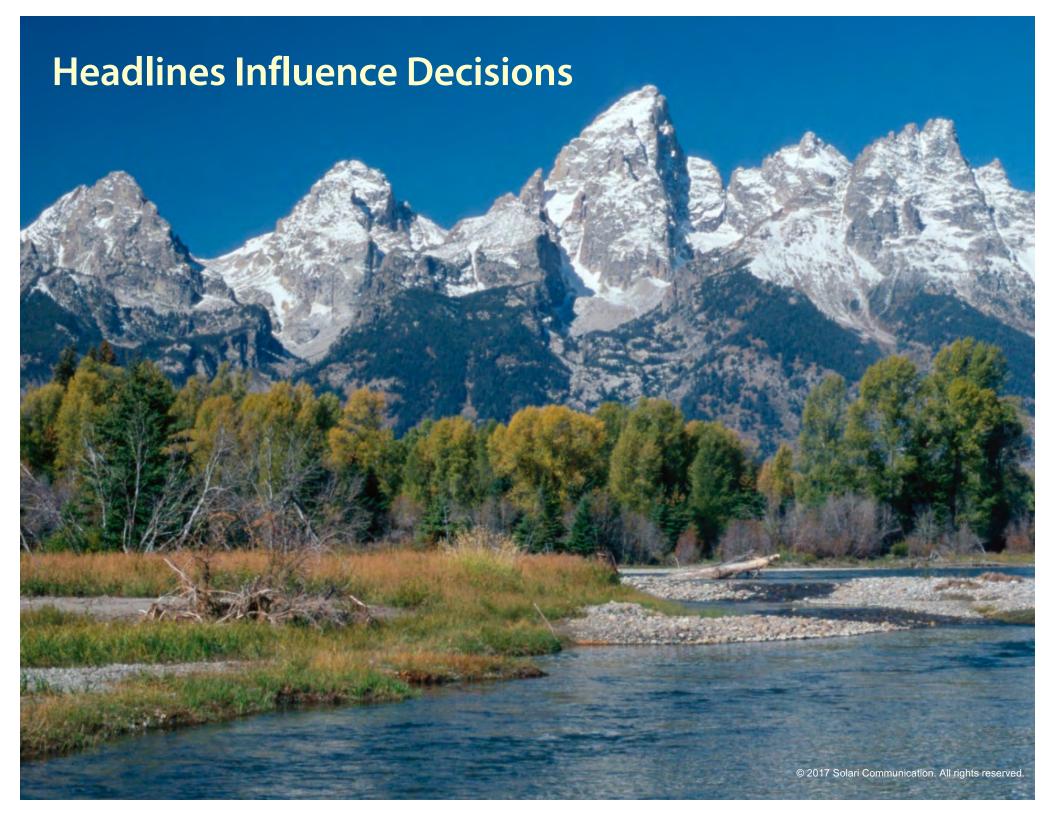
One Final Point

The technical trail is fundamental to resource plans

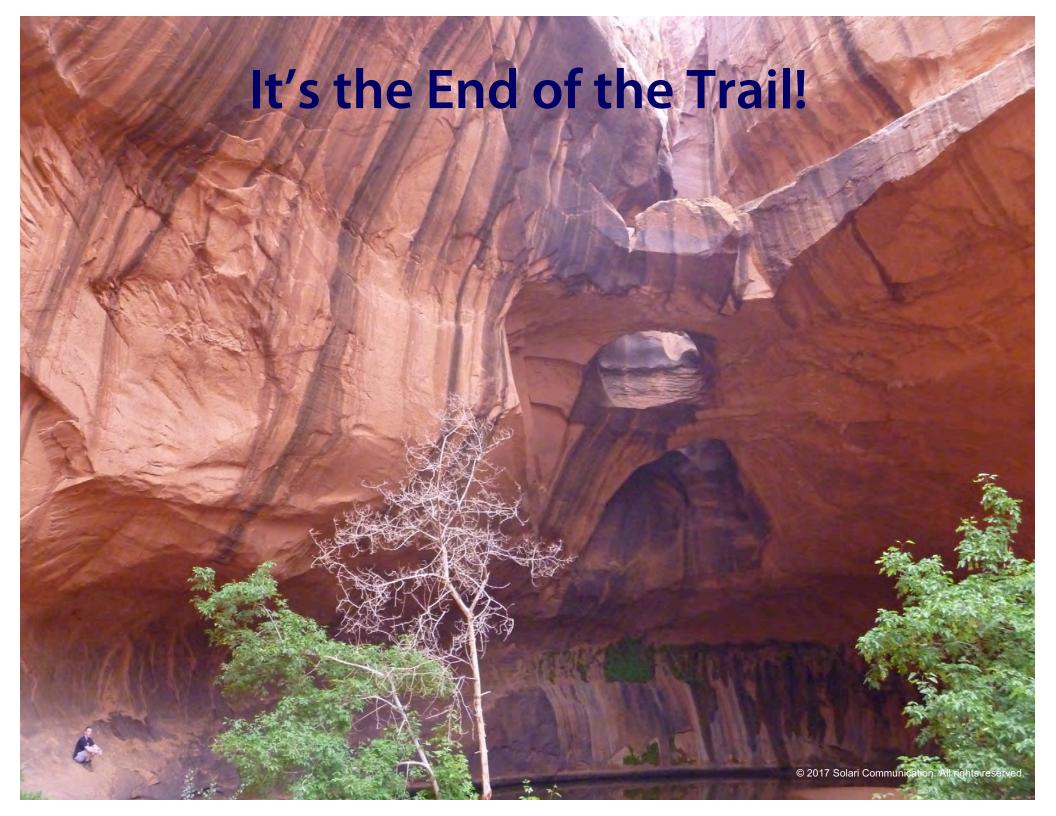
The communication trail is also fundamental to resource plans

That's the insight we derived over these four resource plans











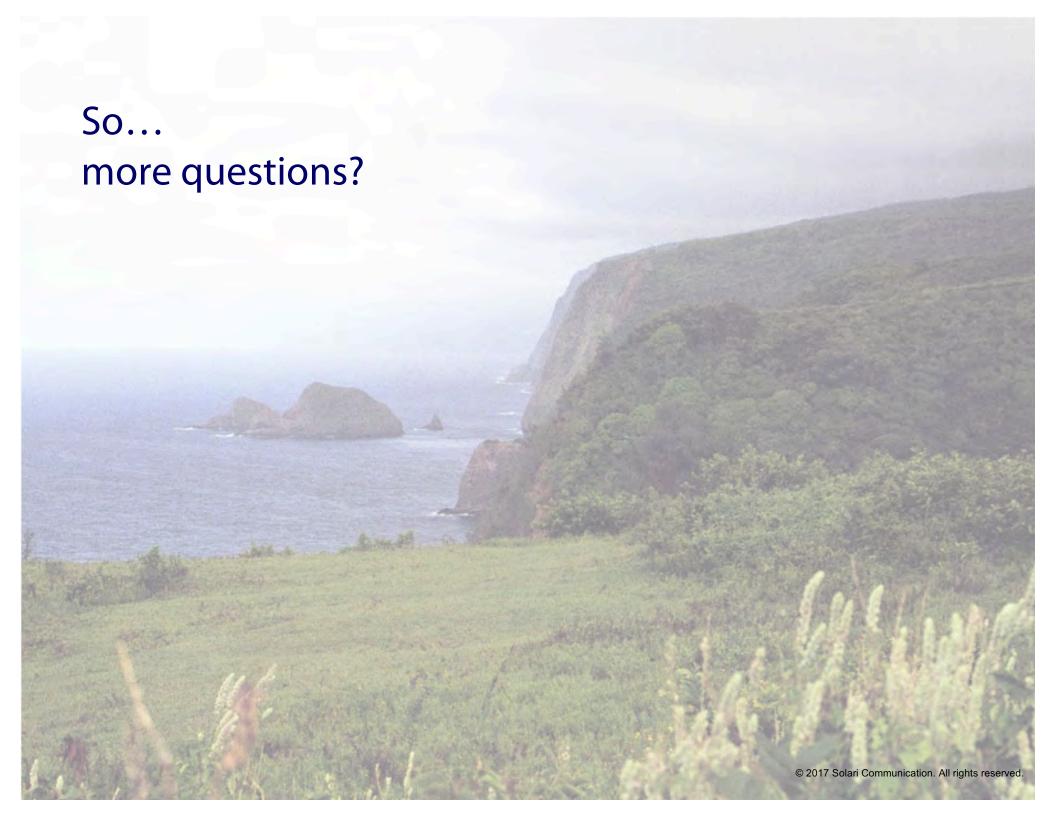




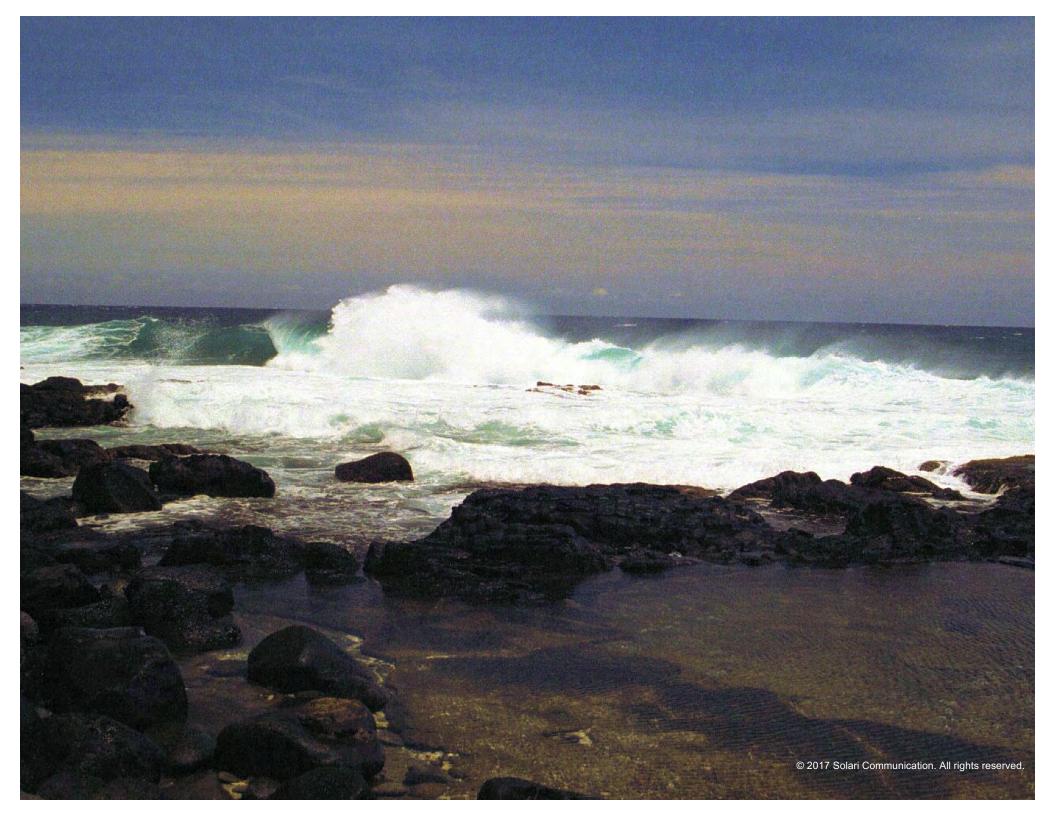


Thank you.





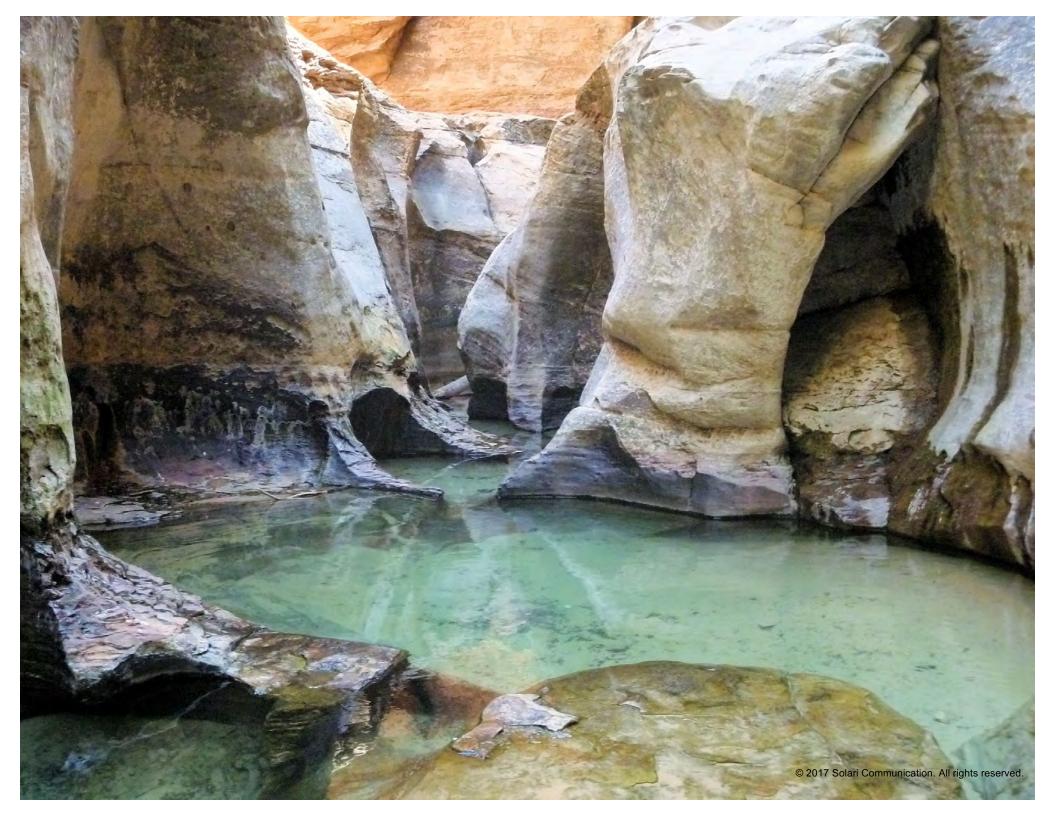


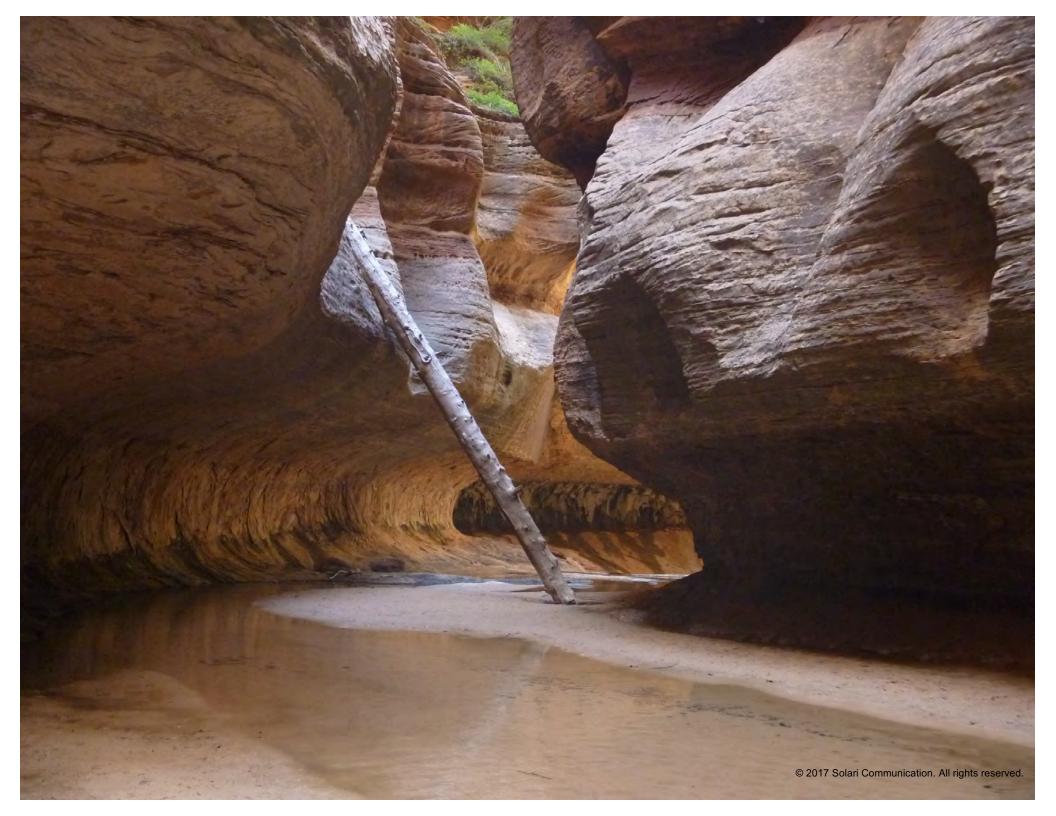










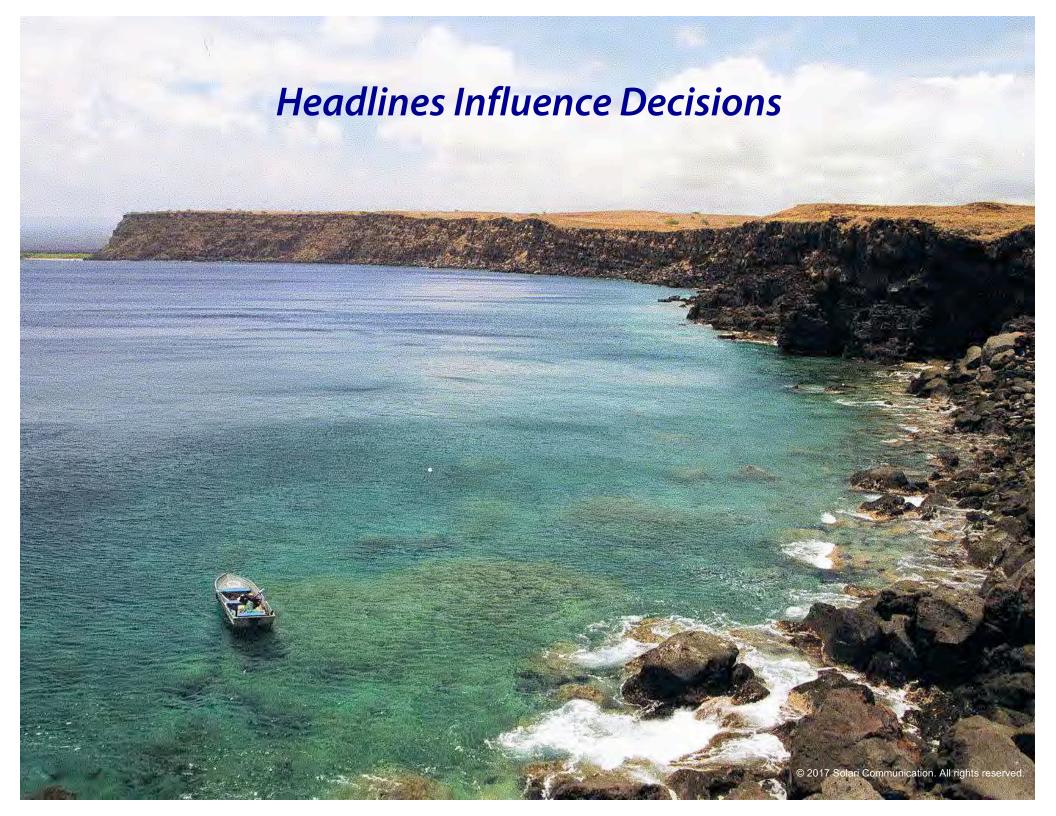






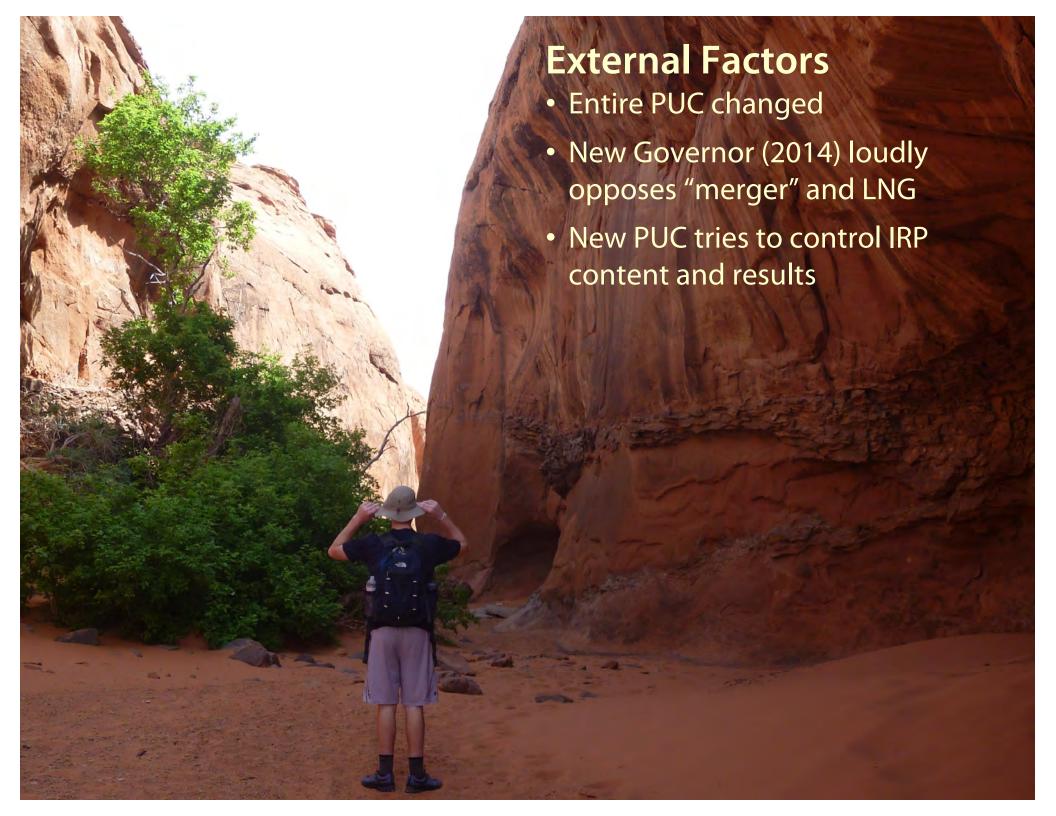














Mar 14

2012

Mar 1

Jun 29 Order announcing IRP 2013; with an updated IRP Framework:

- Goal and governing principles
- Commission, utility, government, and public roles
- Independent Entity and 68-person Advisory Group
- Planning process and guidelines

Order starting IRP 2013:

Deadline: 365 days after Advisory Group formed

IE named; Advisory Group formed. Represented are:

- Local businesses and associations
- Legislature
- Environmental groups
- Energy developers
- County officials
- Governmental agencies
- Residents

Jul 19

Aug

Dec

2013

Jan –

May

More Commission direction:

Principal Issues and questions to address

IRP process:

- Monthly day-long Advisory Group meetings
- IRP based on scenario planning: two-day interactive session
- 17 Principal Issues to address
- Statute: 25% RPS by 2020; 40% RPS by 2030

IRP process:

- Monthly day-long Advisory Group meetings
- 7 additional technical sessions
- 17 Principal Issues to address
- Statute: 25% RPS by 2020; 40% RPS by 2030

Jun 28

Jul 29

Sep 9

Dec 20 IRP 2013 filed; individual action plans for each utility.

- Exceeds RPS goals
- Lowers customer bills
- Modernizes the grid
- Partially transitions to LNG to lower costs and meet environmental standards
- Addresses rooftop solar expansion

Independent Entity "cannot certify" IRP 2013

15 intervenors admitted

Hawaii Electric Light ordered to file a Power Supply Improvement Plan (PSIP):

- Within 120 days
- Order cites 24 provisions to address in four Component Plans

Apr 21

Apr 28 Hawaii Electric Light files Power Supply Plan (PSP)

Never ruled on

Four months late, Commission "rejects" IRP 2013 for:

- Not complying with the Framework
- Failing to meaningfully address 13 of 17 Principal Issues

Includes Commission's Inclinations as basis for resource plans; three major sections:

- Creating a 21st century generation system
- Creating modern T&D grids
- Reforming policy and regulatory policies to achieve Hawaii's clean energy future

Two additional orders to continue PSIP process

PSIPs: 2014



Apr 28

Apr 28

Aug

Aug **26**

Hawaiian Electric ordered to file five plans:

- Interconnection Requirements Study: 30 days
- Distribution Circuit Monitoring program: 60 days
- Distributed Generation Interconnection Plan: 120 days
- Integrated Interconnection Queue plan: 120 days
- Power Supply Improvement Plan (PSIP): 120 days addressing 37 provisions within 7 Component Plans

Maui Electric ordered to file a Power Supply Improvement Plan: 120 days addressing 21 provisions within 4 Component Plans

PSIP docket established

Hawaiian Electric, Maui Electric, and Hawaii Electric Light all file individual PSIPs containing some overlapping company-wide information...

Aug 26 All three filed 2014 PSIPs:

- Exceed RPS mandates
- Transition to LNG
- Upgrade the T&D grid
- Reduce customer bills
- Respond to all Component Plans

Sep 12

Public comments invited

2015

Jan 29

NextEra files "merger" application

Mar 2

Order issued to address "merger" application

Apr –

_

Sep

NextEra and Hawaiian Electric file over 27,000 pages in response to intervenor and Commission IRs



Nov 4

Nov 25

Dec 2

Dec 11

Dec 17 2014 PSIPs mostly rejected; update ordered:

- Initial Statement of Issues outlined
- 8 Observations & Concerns
- Revision Plan by November 25, 2015
- Interim PSIP Update by February 15, 2016
- Updated PSIP by April 1, 2016
- 22 intervenors rejected, but admitted as participant "Parties"

Revision Plan filed

"Merger" hearings begin

One more Party added

First stakeholder conference

201	6
Jar	1

First technical conference

Interim PSIP Update filed:

Feb 16 • Decision Framework: DER, DR, utility-scale resources

- Party input
- "Merged" utility commits to speeding up RPS attainment

Mar 8

Second technical conference

Mar 11

"Merger" headings end; 7,200 transcript pages

Apr

Updated PSIP filed, work still to be done:

- LNG as a transition fuel
- 383 MW 3x1 CC
- Addresses 7 of 8 Observations & Concerns
- Comprehensive grid transformation
- Exceeds RPS mandates
- Oahu-based utility-scale wind and solar potential



Apr 26 Hawaii Natural Energy Institute publishes "Alternative Ownership for Electric Utility on O'ahu and Hawaii Island"

May 17

Second stakeholder conference

Jun 3

Public comments invited

Jun 29

Third stakeholder conference

Jul 15

"Merger" dismissed without prejudice

Order to clarify Revised PSIP content:

- Six additional issues to address
- Two more technical conferences
- Work Plan by September 7
- Revised PSIP by December 1
- Party IRs
- Party and Hawaiian Electric SOPs

Aug 16

201
Au ₉
Aug –
Oc
Sep 7
Sep 21
Oc ⁻

Oct

17

Hawaiian Electric Motion for Clarification: never ruled on

Four additional stakeholder meetings

Revised Work Plan filed:

- Updated analysis process using 3 modeling tools
- Updated assumptions
- Updated O'ahu-sited utility scale wind and solar potential

Third technical conference

Fourth technical conference

Order changing PSIP deadline to December 23

- Extends IR and SOP deadlines
- Removes Hawaiian Electric SOP requirement

2016 Nov 14	Order extending IR and SOP deadlines
Dec 23	 Revised PSIP filed: Accelerates renewable generation 52% RPS by 2022 No LNG Molokai 100% renewable energy by 2020 Maximizes DER Modernizes the grid
2017 Feb 14	SOPs filed, including a Hawaiian Electric SOP
	And the waiting begins

Thank you.

