



# County of Maui Integrated Solid Waste Management Plan

Briefing for the  
County of Maui Council Members  
February 24, 2009  
Morning

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# Presentation Outline

1. *Why Do A Plan?*
2. SWRAC
3. Current Solid Waste Practices
4. Recommendations
5. Comparison of Current vs. Recommended
6. Public Information Meetings and Hearings
7. Comments from State of Hawaii Department of Health
8. Afternoon Briefing Agenda
9. Questions and Discussion

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## *1. Why Do A Plan?*

- ✓ Hawaii State Law requires it
  - ❖ Last Plan done in 1994
- ✓ Over one-year in the making
- ✓ State Law established a 50% recycling goal be reached by January 2000
  - ❖ In FY2007, County at 34%
- ✓ Central Maui Landfill filling up
  - ❖ Current capacity runs out in 2026
- ✓ Maui County continues to grow
  - ❖ 1,000 tons per day currently; 1,400 projected in 2030



## Some Terms To Remember

- ❖ C&D = construction and demolition materials
- ❖ CML = Central Maui Landfill
- ❖ Commingled = mixed containers (plastics & metals)
- ❖ E-waste = electronics, TVs, computers, cell phones, etc.
- ❖ FOG = Fats, oils, and greases
- ❖ GF = County General Fund
- ❖ HI-5 = State of Hawaii 5 cent deposit on certain beverage containers
- ❖ HHW = Household hazardous waste
- ❖ M = Million
- ❖ MECO = Maui Electric Company
- ❖ MRF = materials recovery facility
- ❖ MSW = Municipal solid waste
- ❖ Single-stream = combined mixed paper and commingled containers for recycling collection and processing
- ❖ SWRAC = Solid Waste Resource Advisory Committee
- ❖ WasteTEC = Waste to energy conversion technologies



## ISWMP Process

- County Management commits to process and selects consultant
- Mayor appoints SWRAC
- Data collection
- Develop current status and four scenarios
- Develop scenario costs
- Select scenario for implementation
- Public participation & state approval





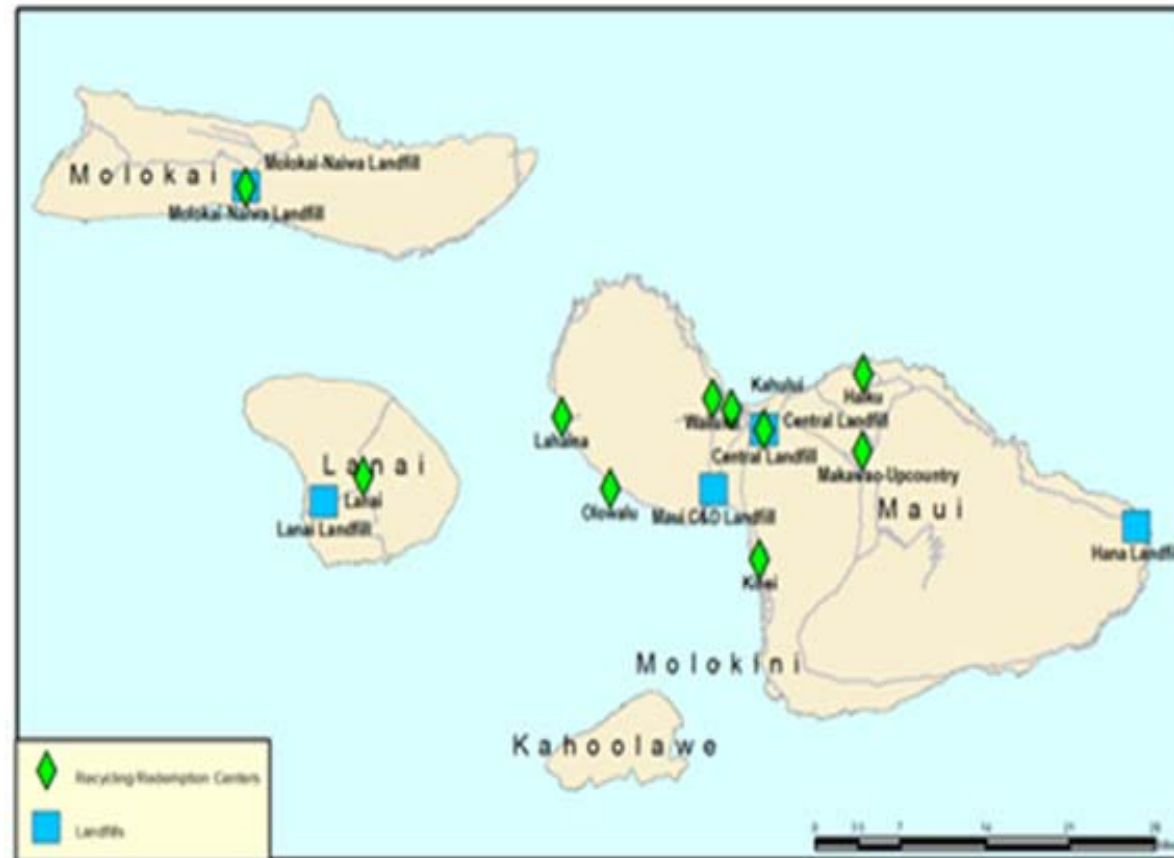
## 2. SWRAC

- Community input required by state law (HRS Section 342G)
- Composed of 16 members appointed by Mayor
  - Concerned citizens
  - Industry leaders
  - Members of the County Council
- 7-day research tour in Oregon and California
- 12 noticed meetings on current solid waste practices on Maui and industry best practices
- 18 consensus points recommendations made for the Plan





### 3. Current Solid Waste Practices



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## County Refuse Collection

- Solid Waste Division collects from single-family residential properties on roads meeting County standards
- In FY2007, 24,000 voluntarily subscribed of the 51,000 possible households
- Once or twice per week refuse service
- Agreement with Union controls pick-ups per route
  - 1000 for automated
  - 350 for manual



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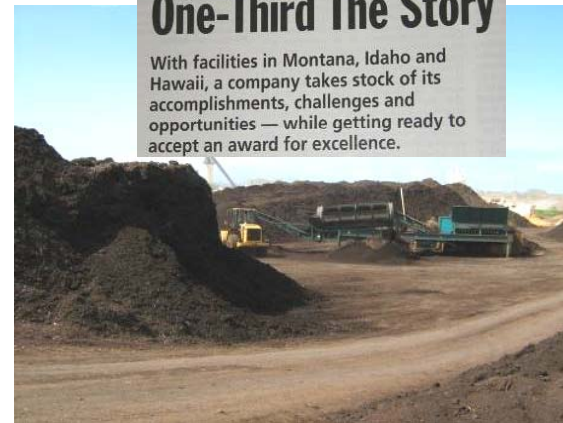
## County Recycling Efforts

- 9 recycling centers
- 17 redemption centers
- Public-private partnerships for
  - Composting yard waste and biosolids
  - Converting fats, oils, and greases to biofuel
- Collection opportunities for paint, batteries, electronics
- Collection sites for used motor oil recycling



### Gold Medal For Composting Is Only One-Third The Story

With facilities in Montana, Idaho and Hawaii, a company takes stock of its accomplishments, challenges and opportunities — while getting ready to accept an award for excellence.





## County Services on Maui Island (without Hana)

	Now
<b>Residential Refuse Collection</b>	<b>Collected by manual (once per week)/automated (twice per week) from 24,000 of the 51,000 eligible properties</b>
<b>Recycling</b>	<b>No collection</b>
<b>Disposal</b>	<b>MSW &amp; CD Landfills</b>
<b>White goods</b>	<b>Collection by appointment &amp; direct delivery to processor</b>
<b>Bulky waste</b>	<b>No collection</b>
<b>Green waste</b>	<b>No collection</b>
<b>HHW</b>	<b>No collection</b>

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# County Services on Hana

	Current
<b>Residential Refuse Collection</b>	<b>County collection of 249 homes out of 670, one truck, collected manually by Highway Division staff</b>
<b>Recycling</b>	<b>No collection, private redemption center</b>
<b>Disposal</b>	<b>Hana Landfill, 1400 tons in FY2006</b>
<b>White goods</b>	<b>No provision</b>
<b>Bulky waste</b>	<b>No collection</b>
<b>Green waste</b>	<b>Unprocessed, segregated</b>
<b>HHW</b>	<b>No provisions</b>





# County Services on Lanai

	Current
<b>Residential Refuse Collection</b>	<b>County collection of 640 homes out of 1300, one truck, automated collection operated by the landfill staff</b>
<b>Recycling</b>	<b>No collection, redemption center in Lanai City</b>
<b>Disposal</b>	<b>Lanai Landfill, 5100 tons in FY2006</b>
<b>White goods</b>	<b>No provisions</b>
<b>Bulky waste</b>	<b>No collection</b>
<b>Green waste</b>	<b>No collection, some landfilled</b>
<b>HHW</b>	<b>No provisions</b>





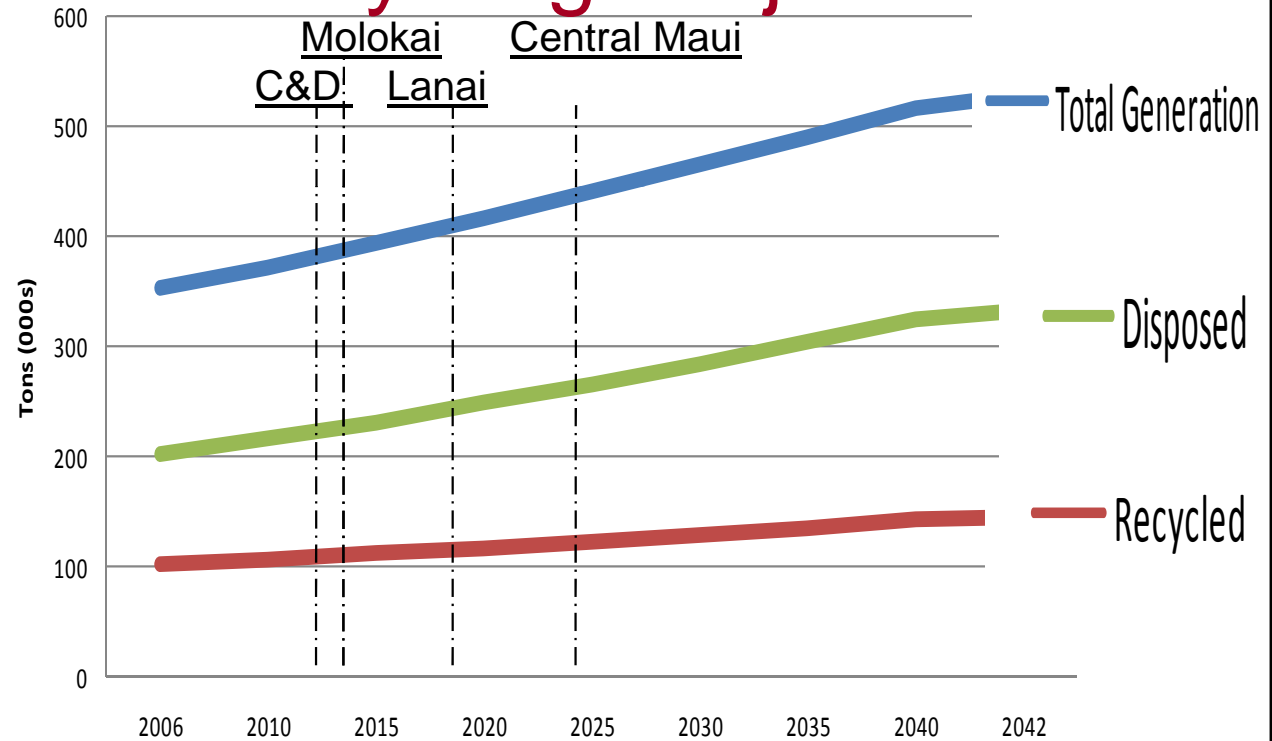
# County Services on Molokai

	Current
<b>Residential Refuse Collection</b>	County collection of 595 homes out of 2400, one truck, collected manually by Highway Division staff
<b>Recycling</b>	No collection, mobile collection unit plus drop off at landfill redemption center (County supported)
<b>Disposal</b>	Naiwa Landfill, 7600 tons in FY2006
<b>White goods</b>	Recycled at Landfill as of July 2008
<b>Bulky waste</b>	No collection
<b>Green waste</b>	No collection, grinder at the landfill
<b>HHW</b>	No provisions





# County Waste and Recycling Projections



---- Dashed lines above indicate year landfill reaches capacity.

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## Disposal in the County

Landfill	Owner	Items Taken	Estimated Year Capacity Is Reached	Tons Per Day (365 days/year)
Central Maui	County	MSW	2024*	550
Decoit C&D	Private	C&D	2012	137
Hana	County	MSW	2096	3.8
Lanai	County	MSW	2020	14.0
Molokai	County	MSW	2015	20.8

\* Assumes C&D materials start coming to CML in 2013; if not, CML reaches capacity in 2026.





## Global Findings

- Challenges inherent in operating on three islands
- Amount of waste generated in County will continue to increase
- Landfill space in County is finite
- During Plan preparation:
  - Value of recyclable materials and energy products that can be derived from waste is increasing
- Now, with economic downturn:
  - Value of recyclables and fuel have fallen off greatly





## Value of Products in Plan

- Curbside recyclable materials
  - \$130 per ton revenue (West coast U.S.)
  - \$75 per ton cost (container shipping)
  - \$55 per ton net revenue
  - Plus HI – 5 redemption value : None
- C&D recyclable materials
  - \$40 per ton revenue (Maui markets; net of transportation)
- Electricity, WasteTEC to MECO
  - 400 kilowatt hours per ton
  - \$0.15 per KWHr
  - \$54 revenue per ton



## 4. Recommendations

- 60 % Recycling
  - MRF
  - C&D MRF
  - Legislation
- Universal Collection Services
- Household Hazardous Waste
- WasteTEC
- Disposal



## MRF to Process Recyclables

- Single-stream processing trend now
- Capital - \$18 million
- O&M - \$75 per ton
- Revenue - \$55 per ton
- Net cost - \$20 per ton\*

\* HI-5 redemption value not included in Plan



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## Residential Collection Service

Universal for all single-family residences served by streets and roads meeting County standards with large carts

1. **Refuse** collected once per week
2. **Single-stream recyclables** collected once every other week
3. **Yard and large green waste** collected in cans, paper bags, or bundled
4. **Bulky and White goods** collection expanded to single family residents
5. **Call center** handles all service requests and inquiries





## C&D Recycling and Disposal

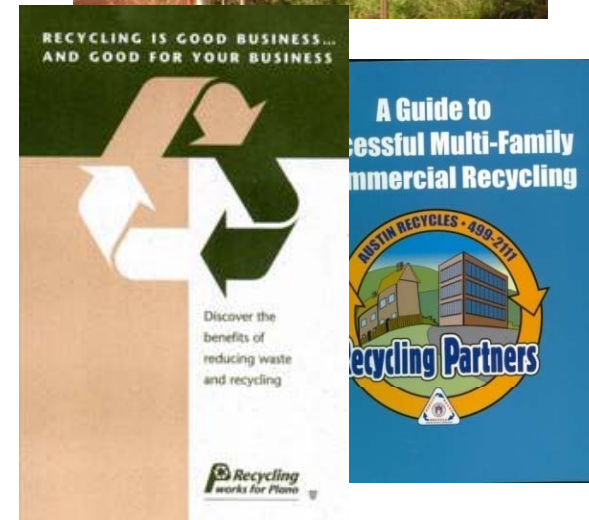
- County-initiated C&D MRF
- Ordinance requiring 50% C&D recycling by 2013
- County provides grants to encourage reuse
- Capital - \$8.7 million
- O&M - \$67 per ton
- Revenue - \$24 per ton
- Net cost -\$43 per ton





## Other Efforts Needed to Reach 60% Recycling

- Recyclable drop-offs continue and are improved
- Mandatory commercial recycling legislation by 2013
- Mandatory commercial food waste recycling
- Increased metal recycling
- Increased E-waste recycling
- Increased County public education and enforcement



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## Household Hazardous Waste Facility for HHW and E-Waste



- Permanent Facility
  - 312 tons per year
  - Capital - \$872,000
  - O&M - \$1,200 per ton
  - Net Revenue - \$0
- HHW examples: paints, chemicals, solvents, fertilizers, weed killers, pharmaceuticals, etc.
- Event Collection
- Reuse Shop
- Recycle More



# Disposal Recommendations

## WasteTEC –

- Pursue Maui County-specific feasibility study for alternative conversion technologies to convert waste to electricity or other consumable fuel
- Capital - \$86 million
- O&M - \$134 per ton
- Revenue - \$54 per ton
- Net Cost - \$80 per ton







## WasteTEC Technologies and Risk

Alternative	Risks/Liability	Risk Summary
<b>Mass Burn/WaterWall</b>	Proven commercial technology	Very Low
<b>Mass Burn/Modular</b>	Proven commercial technology	Low
<b>RDF/ Dedicated Boiler</b>	Proven commercial technology	Low
<b>RDF/Fluid Bed</b>	Proven technology; limited U.S commercial experience	Moderate
<b>Pyrolysis</b>	Previous failures at scale, uncertain commercial potential; no operating experience with large scale operations	High
<b>Gasification</b>	Limited operating experience at only small scale; subject to scale-up issues	High
<b>Anaerobic Digestion</b>	Limited operating experience at small scale; subject to scale-up issues	High
<b>Mixed-Waste Composting</b>	Previous large failures; No large-scale commercially viable plants in operation; subject to scale-up issues	Moderate to high
<b>Chemical Decomposition</b>	Technology under development; not a commercial option at this time	High

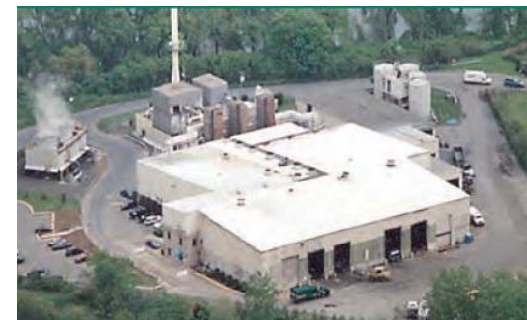


Source: GBB; December 2008.



## WasteTEC – Energy Opportunity

- County-initiated facility sized for 360 tons per day
- Electricity output
  - 14 megawatts power net capacity
    - 47 million kilowatt hours per year exported
  - Displaces 5% of MECO's fuel oil purchases
    - Approx. \$8.3 million per year (@ \$120 per barrel)
- Extends CML life to 2042





# Disposal Recommendations

- Olowalu Convenience Center
  - Convert to transfer station
- Central Maui Landfill
  - Remains active; reaches capacity in 2024
  - 60 % recycling extends CML to 2031
  - If WasteTEC starts operating in 2013, CML reaches capacity in 2042
- Lanai and Molokai landfills
  - Evaluate for standby status
- Hana:
  - Put landfill on standby
  - Add full-service convenience center



## 5. Comparison of Current vs. Recommended

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COMPARISON	Current	Recommended
Diversion Rate	30%	60%
Curbside Customers	27,000	44,000
Curbside Recycling	No	Yes
Curbside Bulk Item	No	Yes
Curbside White Good	Partial	All
Household Hazardous Waste Facility	No	Yes
Materials Recovery Facility (MRF)	No	Yes
Construction and Demolition MRF	No	Yes
Active Landfills	4	3
Curbside Pilot Yard Waste	No	Yes
Generating Electricity from Garbage	No	Yes
Central Maui Landfill Phase VI Capacity Used Up (with C&D)	2024	2042
Education	Not separate budget item	\$2/HH implementation \$1/HH sustained
Average Annual Division Budget 2006 – 2042	\$50 million	\$107 million
Cumulative Capital Needed	\$76 million	\$200 million
General Fund Contribution	\$19/ton	\$0/ton

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# Maui Island

	Current	Recommended
Refuse Collection	Collected by manual/automated	Weekly collection of carts with semi-automated truck
Recycling	No collection	Single stream materials in carts collected curbside every other week with semi-automated truck; drop-off at convenience center; all sent to MRF
Disposal	MSW & CD Landfills	WasteTEC; C&D sorting
Metal and white goods	Collection by appointment & direct delivery to processor	Collection by appointment & direct delivery to processor
Bulky waste	No collection	Collection by appointment
Green waste	No collection	Pilot curbside collection program
HHW	No collection	Permanent Facility Open throughout the year





# Hana

	Current	Recommended
Refuse Collection	Collected manually by Highway Division staff from 249 homes	Weekly collection of carts with semi-automated truck from 670 homes
Recycling	No collection	Single stream materials in carts collected curbside every other week with semi-automated truck; drop-off at convenience center
Disposal	Landfill	Full service convenience center; base yard; landfill on standby with permit; transfer station
Metal and white goods	No collection	Curbside collection by appointment; roll off at convenience center
Bulky waste	No collection	Curbside collection on regular trash day
Green waste	No collection	Pilot curbside collection program
HHW	No collection	Periodic collection events





# Lanai

	Current	Recommend
Refuse Collection	Collected weekly with automated truck from 640 homes	Expand weekly collection of carts with automated truck to 1,300 homes
Recycling	Drop-off	Single stream materials in carts collected curbside every other week with automated truck
Disposal	Landfill	Evaluate landfill to put on standby
Metals and white goods	No collection	Curbside collection by appointment; drop-off at facility; scrap auto removal at least annually
Bulky waste	No collection	Curbside collection by appointment
Green waste	No collection	Pilot collection program
HHW	No collection	Periodic collection events







# Molokai

	Current	Recommended
Refuse Collection	Collected manually by Highway staff from 600 homes	Weekly collection of carts with semi-automated truck from 1,200 homes
Recycling	Drop-off	Single stream materials in carts collected curbside every other week with automated truck; continue drop-off
Disposal	Landfill	Evaluate putting landfill on standby with and adding convenience center
Metal and white goods	No collection	Curbside collection by appointment through call center; drop-off at facility; scrap auto removal at least annually
Bulky waste	No collection	Curbside collection on regular trash day
Green waste	Drop-off program with material ground and provided back to residents	Continue drop-off program with material ground and provided back to residents
HHW	No collection	Periodic collection events





## 6. Public Information Meetings and Hearings

- **Monday, July 21 – Hana:** Hana Community Center Cafeteria
- **Tuesday, July 22 – Lahaina:** Lahaina Civic Center Social Hall
- **Wednesday, July 23 – Wailuku:** Wailuku/Velma Santos Community Center
- **Thursday, July 24 - Lanai City, Lanai:** Lanai Community Center
- **Friday, July 25 – Kaunakakai, Molokai:** Mitchell Pauole Community Center





## Public Testimony

1. Add more local facilities for residents & businesses
2. Implement more green waste recycling
3. Clean-up derelict cars & appliances, which will help prevent Dengue fever
4. Utilize waste for energy or fuel
5. Add MRF and other MSW infrastructure
6. Implement more recycling



## Public Testimony (Continued)

7. Willing to pay more for increased services
8. Add C&D recycling
9. Add Household Hazardous Waste (HHW) program
10. Develop detailed implementation plans for the individual programs
11. Concern: nothing will be done, "Plan will sit on shelf"
12. Concern: waste to energy air emissions, ash toxicity and health risks



## Public Testimony (Continued)

13. Concern: WTE will reduce recycling
14. Concern: curbside recyclables will be stolen
15. Integrate ISWMP into community-specific Community Plans
16. Concern: ISWMP development not be limited to residents
17. Concern: data tables in ISWMP may be wrong
18. Concern: ISWMP lacked imaginative solutions



## 7. State of Hawaii Comments on The Draft Plan

- Comments received November 5, 2008
- Most comments provided either additional commentary to include or requested clarifications
- Major comment:
  - “Stand-by” status in permitting landfills not recognized; so, need to address re: Hana, Lanai, and Molokai landfill recommendations
- Closing comment:
  - “...the draft plan document contains all components required...and the County of Maui has adequately met the procedural requirement of HRS §342G.”



## 8. Afternoon Briefing Agenda

- Update on impact of recent changes in economy on the Plan
- Detailed review of the current and recommended scenario
- More opportunity to answer questions



## 9. Questions and Discussion

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*Mahalo!*

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