MAINSTREAMING ADAPTATION: CALIFORNIA + AUSTRALIA

PRESENTED BY:
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REALITY OF CLIMATE RISKS

- Holland Island, Maryland (1953)
- Succumbs to SLR (2010)
CLIMATE CHANGE? WELLL, THAT'S A RELIEF. FOR A MINUTE, I THOUGHT ONE OF US WAS EXPERIENCING SOME SERIOUS BLADDER CONTROL ISSUES...
A Word About California CAP Evolution

First Generation
- Policy only, all GHG

Second Generation
- Action, GHG numbers

Third Generation
- Adaptation recognized

Fourth Generation
- Adaptation actions, re-integration into GP
Another CAP Trend – Economics Co-benefits

Then
- Government studies, policies, and actions
- (Maybe) concern about cost, none about the economy

Now
- Public and private sector actions
- Economic resilience, job formation, co-benefits count
CAP With Adaptation – Example 1: Yolo County

- Yolo County

- 3rd Generation CAP
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Yolo County must prepare for a future where competition for water resources between farming, cities, and the environment is greater than at the present time.

**Water Supply**
Several recent studies have shown that Yolo County’s water supply systems are sensitive to climate change. However, experts are uncertain about what the overall effects will be on water supply.

Some models indicate that drier conditions will cause decreased reservoir supplies and river flows. Other models predict wetter conditions with increased reservoir inflows and storage, and increased river flows.

Despite this uncertainty, it is still widely accepted that changes in water supply will occur and that water yields from reservoirs are expected to be unreliable. Yolo County must prepare for a future where competition for water resources between farming, cities, and the environment is greater than at the present time.

Furthermore, climate change is also expected to result in more variable weather patterns, leading to longer and more severe droughts, which could lead to lower aquifer levels for those farmers dependent on groundwater.

**Snowpack and Runoff**
By delaying runoff during the winter months when precipitation is greatest, snow accumulation in the Sierra Nevada and Cascade Range to the east and the Coast Ranges and Klamath Mountains to the west of the Sacramento River acts as a massive natural reservoir for California. Snowpack typically accumulates from November through the end of March and melts from April through July. The length and timing of each year’s snowpack accumulation and melting periods vary based on both temperature and precipitation.

Hydrologic models indicate that higher temperatures associated with global warming would affect the timing and magnitude of both snowmelt and runoff in California. Despite uncertainties surrounding climate change precipitation effects, there is very high confidence that higher temperatures will change both snowfall and snowmelt in many watersheds. This is particularly relevant to those areas in Yolo County that are dependent on the Sacramento River. These changes could diminish water supplies, increase flooding, and reduce summer soil moisture.
**Measure Description**

Climate change may affect human health in a variety of ways, including direct heat-related health effects and increases in air pollution and mosquito-borne diseases. To prepare for potential health threats, the County will update and revise the Yolo Operational Area Multi-Hazard Mitigation Plan and the Yolo County Office of Emergency Services Standardized Emergency Management System to address the public health risks associated with climate change, including vector-borne disease, heat-related illness and urban heat islands, air quality, wildfire, sea-level rise, and flooding, which are addressed in other measures within the Adaptation Strategy. GHG reduction measures that also serve as adaptation strategies are noted in italics.

**Urban Heat Island Effect:** Improve building envelopes and encourage the application of green roof or cool roof technology, to reduce the need to cool buildings in hot weather. *Measure E-1: Reduce Energy Consumption in Existing Residential and Non-Residential Buildings; Measure E-2: Reduce Energy Consumption in New Residential and Non-Residential Buildings.*

**Air Quality:** Encourage energy conservation, implement energy efficiency strategies and facilitate renewable energy installation to reduce pressure on the electrical grid during heat waves and drought conditions. *Measure E-3: Pursue a Community Choice Aggregation Program; Measure E-4: Increase Onsite Renewable Energy Generation; Measure E-5: Promote On-farm Renewable Energy Facilities.*

<table>
<thead>
<tr>
<th>ACTION</th>
<th>RESPONSIBILITY</th>
<th>TIMEFRAME</th>
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<tbody>
<tr>
<td>A</td>
<td>Update and revise the Yolo Operational Area Multi-Hazard Mitigation Plan and the Yolo County Office of Emergency Services Standardized Emergency Management System to address the public health risks associated with climate change.</td>
<td>Health Department Office of Emergency Services</td>
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<th>PROGRESS INDICATORS</th>
<th>TARGET YEAR</th>
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<tbody>
<tr>
<td>A</td>
<td>2014</td>
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CAP WITH ADAPTATION – EXAMPLE 2: CITY OF SACRAMENTO

- City of Sacramento
  - http://www.sacgp.org/climate_action_plan.html

- 4th Generation CAP – GPU In Process
ADOPTED
FEBRUARY 14, 2012

SACRAMENTO CLIMATE ACTION PLAN

Final Draft
JANUARY 13, 2012

Prepared by
The City of Sacramento

In consultation with
Ascent Environmental, Inc.
Mintier Harnish
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The Energy Alliance Association

2012 Awards:

APA
CA

AEP
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   Appendix B: Phase 1: Municipal Climate Action Plan                                      
   Appendix C: Connection of Actions to General Plan Policies                               
   Appendix D: GHG Emissions Inventory for Sacramento County                             

ADAPTATION INTEGRATED THROUGHOUT
Sacramento’s Rising Temperatures

The Sacramento region has experienced a rise in average temperatures. According to the U.S. Global Change Research Program, winters are now shorter and warmer than they were 30 years ago. The Department of Water Resources (DWR) documented an increase of one degree in the Sacramento watershed over the last century. According to Cal-Adapt, a climate change projection modeling tool developed by California Energy Commission, temperatures in the Sacramento region have historically averaged about 60°F. Temperatures are projected to rise between six and nine degrees by 2100, based on average low and high emissions scenarios.
ADAPTATION MEASURES

STRATEGY 6
CLIMATE CHANGE ADAPTATION

MEASURES
1. Prepare for Increases in Average Temperatures
2. Preserve and Expand Water Sources and Respond to Variable Water Supplies
3. Respond to Increases in Energy Demands and Variable Supplies
4. Protect Public from Increased Health Risks and Safety Hazards
5. Promote a Climate-Resilient Economy
6. Respond to Potential Impacts on Public Infrastructure
7. Protect Natural Ecosystems and Migration Routes

GOAL:
A community that is resilient to the effects and impacts of climate change.

While many of the other strategies address GHG emissions reductions to prevent further climate change, the climate change adaptation strategy prepares Sacramento for dealing with the impacts of climate change and creating climate-resilient communities. As described in Chapter 3 of the Climate Action Plan, the City must prepare for warmer and more extreme temperatures, changes in water supply, drought, flooding, increasing energy needs, and public health risks. The City of Sacramento has made a goal of creating a climate change-resilient community. In implementing the measures included in this Strategy, many GHG reduction measures included in the other Strategy sections also have adaptation benefits. For example, water conservation, energy management, energy efficiency, natural resource conservation, and urban forests are all strategies with adaptive co-benefits that help the city prepare for and cope with the impacts of a changing climate.

By monitoring climate change impacts, staying up-to-date on climate change science, and incorporating climate change thinking into normal planning and other activities, the City will better be prepared for likely future effects. For example, better planned and constructed infrastructure improvements will also allow the City to better manage extreme weather events, flooding, and increasing energy demand. Revised economic and governance strategies that take into account a changing climate will allow the city to grow and thrive despite climate change impacts.
Next Step – Reintegration into the General Plan

- 2035 General Plan Update underway
- Re-integrate CAP policies into the General Plan and “retire” the CAP as a transitional document
- Embed climate adaptation actions into development review process
- Pursue community-wide benefit actions
- Promote economic co-benefits of adaptation
Reintegration into General Plan – Tie In the Economic Co-Benefits

- Increase Home and Building Equity and Resale Value
- Lower Operating Costs for Businesses
- Lower Energy and Fuel Bills
- Lower Water and Sewer Bills
- Support Local Economy

- Increase Competitive Advantage
- Create Jobs
- Improve Public Health
- Improve Quality of Life
GENERAL PLAN AND ADAPTATION STRATEGIES – STARTING AT THE BEGINNING

- Starts with adding climate resilience policies in General Plans
- Already “fits” in GP Elements: Safety, Conservation, Land Use
- Components to include in the GP Update:
  - State of science on climate risks affecting the community using scaled-down data, to the extent it is available in Background Reports/EIR
  - Promote risk assessment for critical community health and safety facilities and important infrastructure
  - Policies for climate resilience, including economic resilience, linking economic development, jobs, long-term cost avoidance to actions
  - Commitment to an implementation plan
  - Consistency determination process that includes adaptation
AUSTRALIAN EXPERIENCE

- Department of Climate Change
  http://www.climatechange.gov.au
Look to Global Leaders in Climate Adaptation

- Australia chose to first prioritize adaptation
- Conducted climate risk assessments
- Developed guidebook and tool kit for local governments

Federal Government Vision

- Establishes importance of climate adaptation to the Federal government
- Provides key climate issues and policy guidance for resilience responses
- Federal government sponsored National Climate Forum in 2010 for knowledge exchange
LOCAL GOVERNMENT ACTION PLAN

- Local government adaptation program guidance

2007; updated in 2009, 2010
AFFECTED LOCAL GOVERNMENT FUNCTIONS

- Roads/pavements
- Drainage infrastructure
- Buildings/systems
- Coastal infrastructure
- Recreational facilities
- Water supply
- Wastewater
- Community health
- Wild bushfire emergencies
- Planning policies
- Development/land use
- Coastal management
- Pest management
- Biodiversity
ADAPTATION ACTION THEMES

- Risk assessment to identify priorities
- Incorporate climate change into community planning
- Adopt climate-sensitive design standards
- Monitor existing infrastructure for retrofit/repair
- Progressively upgrade climate design over time
- Control planning and development in high risk areas
- Reduce stresses on threatened natural systems
TOOL KIT

- Adaptation tools for local government
- Australian Government and ICLEI Oceana

2008
**Tool Kit Approach**

- Establish an interdisciplinary approach
- Identify their current risk management systems and how appropriate they are for climate change
- Examine climate change scenarios and projections to understand the potential impacts
- Analyze and prioritize the risks/opportunities
- Explore treatment options for the prioritized risks/opportunities to develop an action plan
- Establish strategies for monitoring
- Build the personal capacity of participants to deal with complexity and uncertainty.
EXAMPLES OF TOOLS PROVIDED

- Questionnaires
- Planning Workshop Template (facilitator required)
- Tools, Modeling, Risk Assessment, Adaptive Management, and Assumptions Worksheets
- Issue Brief and Direct Impacts Analysis
- Action Plan Template
ADAPTATION PLANNING FLOWCHART

Exhibit 2.2: Adaptive management process

1. Identify the risks
   - Council Questionnaire – T1
   - Planning Workshop Template – T2-6
   - Issue Brief – T7
   - Conceptual Model – T8
   - Support Letter – T9
   - Barriers Document – T10

2. Analyse the risks
   - Issue Brief – T7
   - Conceptual Model – T8
   - Risk Assessment Workshop – T11

3. Evaluate the risks
   - Issue Brief – T7
   - Conceptual Model – T8
   - Risk Assessment Workshop – T11

4. Develop options
   - Involves developing assumptions on the intended outcome of different actions.
   - (Stakeholder Identification Worksheet – T4)
   - Conceptual Model – T8
   - Action Planning Workshop Template – T12
   - Assumptions Worksheet – T13

5. Revise the adaptation action plan
   - Conceptual Model – T8
   - Action Plan Template – T14

6. Review progress
   - Conceptual Model – T8
   - Barriers Document – T10
   - Action Plan Template – T14

7. Implement the adaptation action plan
   - Stakeholder Identification Worksheet – T4
   - Barriers Document – T10
   - Action Plan

8. Develop action/treatment plan
   - Stakeholder Identification Worksheet – T4
   - Conceptual Model – T8
   - Action Planning Workshop Template – T12
   - Assumptions Worksheet – T13
   - Action

- Same as above
RISK ASSESSMENT METHODS ARE STANDARDIZED
**So... What’s Missing to Really “Mainstream” Local Climate Adaptation?**

- A climate resilience vision
- A legislated mandate, by the State, by the Feds, or both
- Better coordination (e.g., emergency services/planners, ARCCA)
- Standards for climate risk and tolerance, adequate climate protection
- Technical assistance/guidance (e.g., general plans)
- Financial assistance for planning and implementation
- Efforts to tackle the thorniest issues:
  - Changing regulatory jurisdiction boundaries
  - Property rights issues
  - Climate justice/social equity/economic equity
  - “Defend, repair when needed, or relocate” decisions for critical facilities/places
THANK YOU

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