



CITY OF CARMEL-BY-THE-SEA

WORKSHOP

Climate Adaptation and Greenhouse Gas Reduction Strategies for Carmel

Climate Committee

November 18, 2021



Workshop Agenda & Logistics

- Project Background
- Carmel Vulnerability to Climate Change
- Carmel Greenhouse Gas Reduction Goals
- Forum: Vision for the Future in Carmel
- Forum: Review of Potential Climate Adaptation and Greenhouse Gas Reduction Strategies

- Providing comments during the workshop
- Providing comments after the workshop



Project Background

- Climate Action and Adaptation Project initiated during Fiscal Year 2019/2020
 - Action: reducing greenhouse gas emissions
 - Adaptation: Developing strategies to adapt to the changing climate
- Climate Committee formed in Fall 2019 with 8 members:
 - 2 Council members: Jeff Baron and Carrie Theis
 - 4 members of the public: John Hill, Michael LePage, Scott Lonergan, LaNette Zimmerman
 - 2 staff members: Agnes Martelet, Environmental Compliance Manager, Evan Kort, Associate Planner
- Consultants: Rincon Consultants, LSA Associates



Progress to Date

- Monthly presentation series to better understand climate threats and opportunities for action in Carmel
- Outreach to community groups and regional partners
- Climate Change Vulnerability Assessment
- Greenhouse Gas Inventories and Draft Forecast
- List of Potential Adaptation Strategies
- List of Potential Strategies to reduce Greenhouse Gas Emissions



Climate Change Hazards

Climate Change Vulnerability Assessment

Stronger Storms
Wildfires
Sea Level Rise
Drought
Increased Temperatures
Fog Changes
Ocean Warming



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Climate Change Vulnerability Assessment

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More intense
storms projected





Climate Change Hazards

Climate Change Vulnerability Assessment

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Large, severe wildfires will continue to occur in the Central Coast region





Climate Change Hazards

Climate Change Vulnerability Assessment

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Monterey County is projected to experience ~5 feet in sea level rise by 2100





Climate Change Hazards

Climate Change Vulnerability Assessment

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Dry years are projected to get drier and are likely to be followed by dry years





Climate Change Hazards

Climate Change Vulnerability Assessment

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Annual average maximum temp is projected to increase by 3.3°F by mid-century and 6.3 °F by end of the century.



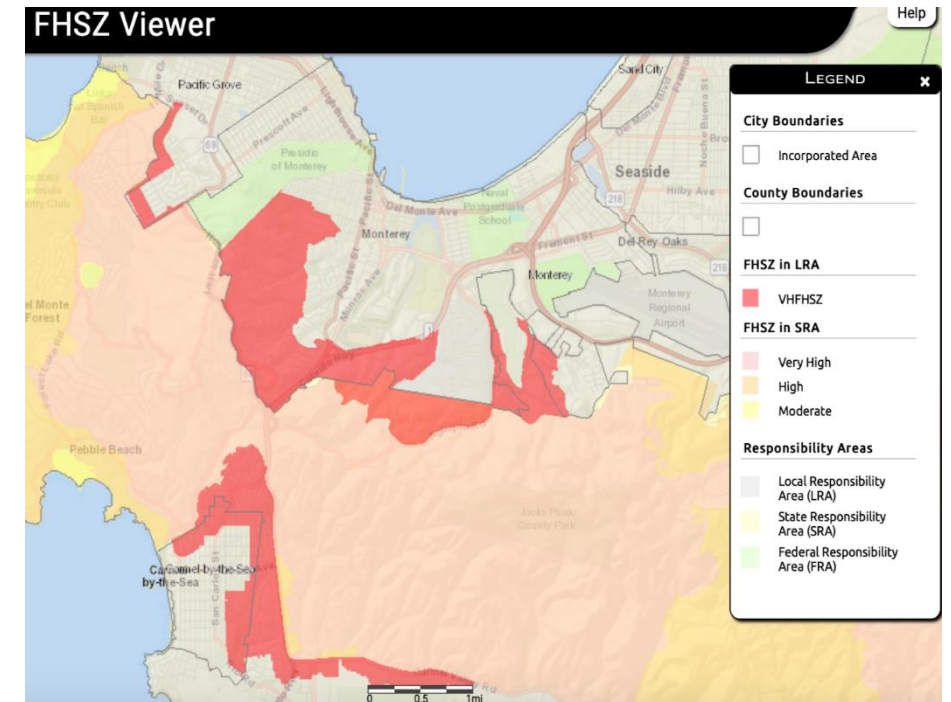
CBTS Assets to Consider

- Community
 - Elderly population and people with disabilities
 - Residents
 - Visitors
 - Local businesses and workers
- Natural Environment
 - Beach
 - Special Habitats and Open Spaces on land and in the ocean
 - Urban Forest
- Infrastructure and Built Environment
 - Utilities (incl. electricity, water, sewer, storm drainage)
 - Shoreline infrastructure (incl. access infrastructure and sea walls and revetments)
 - Critical community facilities
 - Downtown and residences



Vulnerabilities - Community

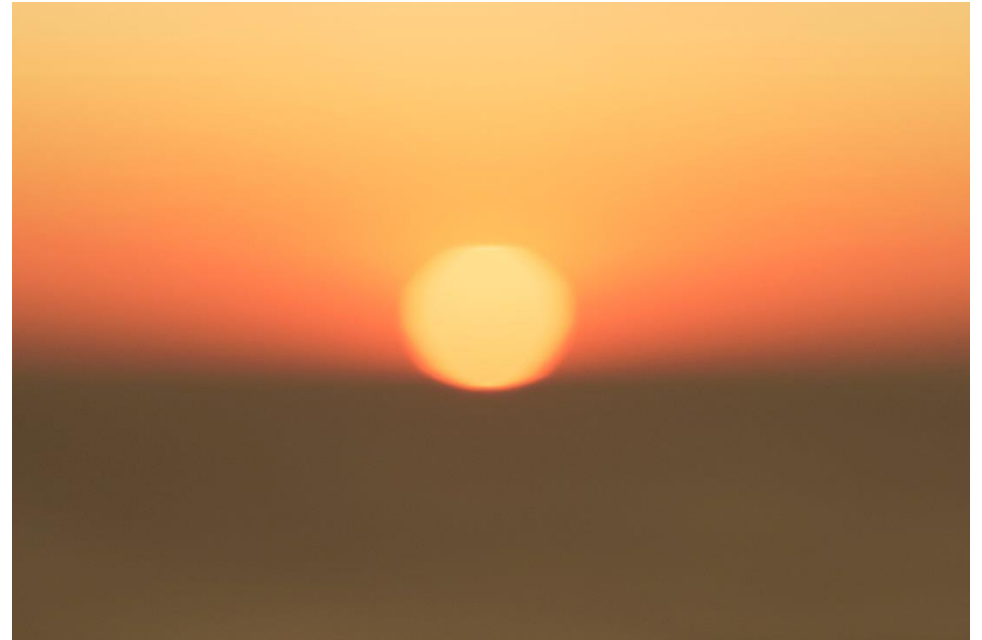
- Very High Fire Hazard Severity Zones (VHFHSZ) in Carmel
- Wildfire vulnerability can be reduced with better siting, landscape design, and building materials
- Lack of a plan for evacuating at-risk community members
- Lack of a plan to support at-risk workers and businesses





Vulnerabilities - Community

- Stronger storms could lead to localized flooding, which could isolate residents
- Increased temperature could lead to negative health impacts for older adults and individuals living with disabilities





Vulnerabilities – Natural Environment

- Increased tree stress due to increased heat, more variable water supply
- Open spaces with sensitive habitats will be impacted by stronger storms, hotter temperatures, drought, and wildfires
- Beach and dune loss from sea level rise
- Monterey Bay National Marine Sanctuary impacts from ocean warming and acidification
- Carmel's urban forest lacks age and species diversity





Vulnerabilities – Infrastructure

Utilities and Infrastructure:

- Access and utility infrastructure along the coastline
- Coastal protection infrastructure: revetments, sand ramps, and sea walls. Sea walls undercutting due to erosion and retreat of surrounding sand stone. 10 hot spots with significant damage after major storms (1982-83)
- Storm drain system only designed to handle 10-year storms and in need of repairs
- CAWD wastewater facility will need to be relocated by 2062
- Power grid impacts of wildfires and storms





Vulnerabilities – Built Environment

- City Planning guidelines conflict with California fire codes in the VHFHSZ
- Lack of defensible space around homes
- Extreme heat may lead to increased use of air condition which could tax the electrical grid
- Lack of cooling infrastructure





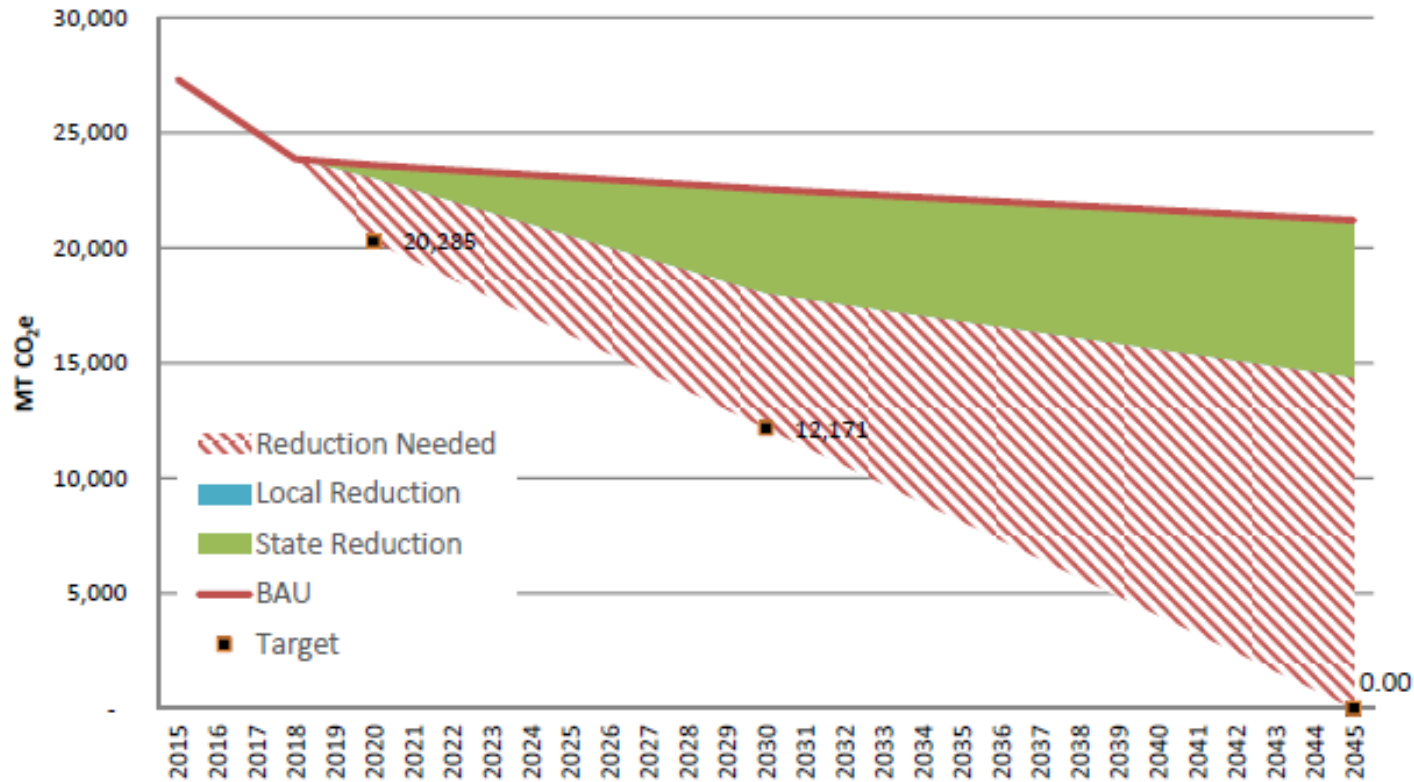
Climate Change Mitigation





Carmel Greenhouse Gas Reduction Goals

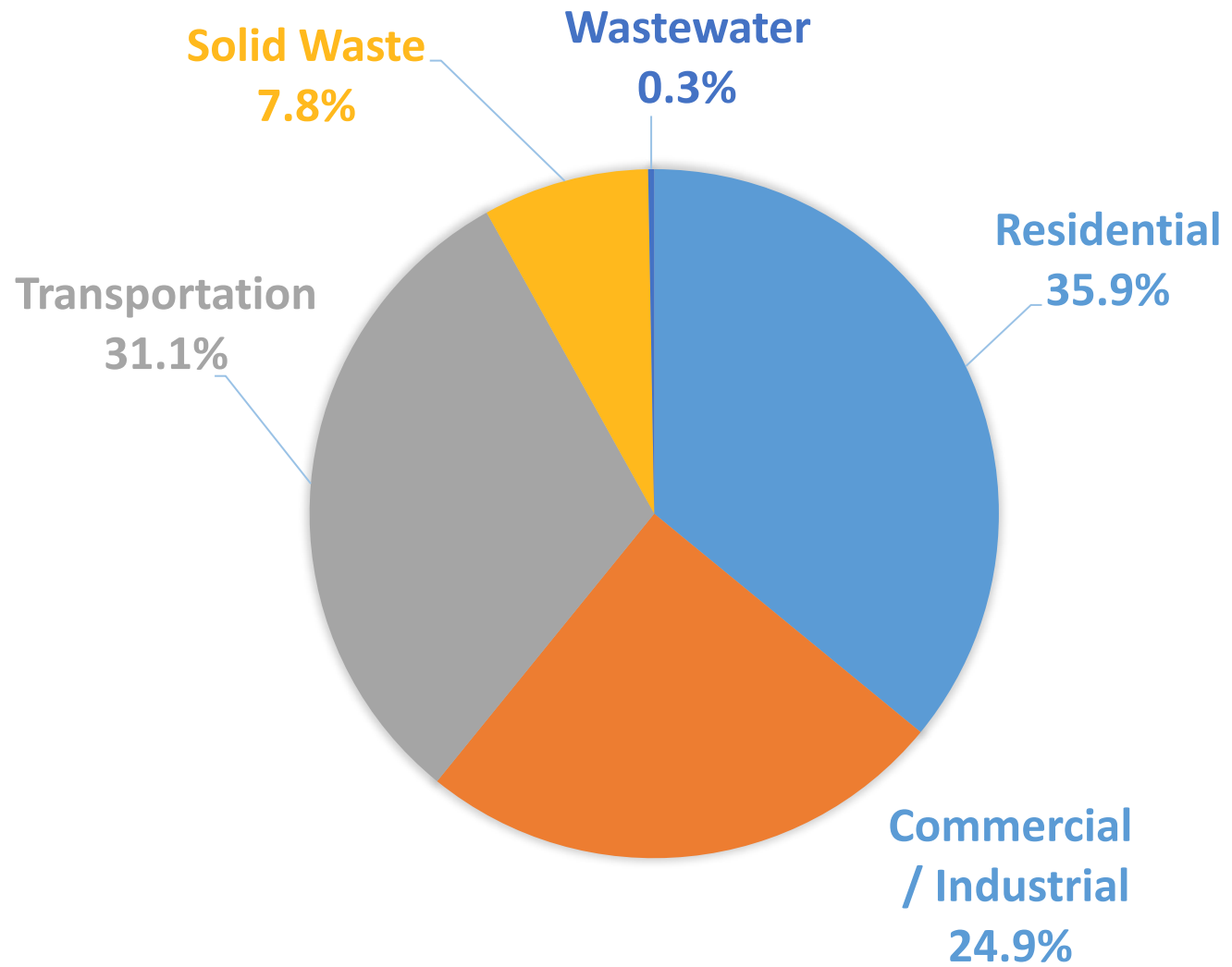
FIGURE 1: State and Local Reductions Comparison with Targets
City of Carmel-by-The-Sea, 2015 - 2045



State measures and reduction goals are estimated based on the 2015 *GHG Inventory and Population Forecasting* by AMBAG. Targets are set based on CARB recommendations using the 2015 GHG Inventory as a baseline (2020 target = 15% reduction from 2015 emissions, 2030 target = 40% reduction from the 2020 target, 2045 target = net zero emissions).



Carmel 2018 GHG Emissions by Sector





Forum: Envision Resilient Carmel in 2050

- What aspects of Carmel help the community's resilience? What actions have the city and constituents taken to reduce their impact and adapt to climate change?
- What does a resilient Carmel community look like? What outcomes are we hoping to achieve?





Forum: Envision Sustainable Carmel in 2050

Mural Notes/Exercise



Potential Strategies for Adaptation and GHG Reduction

Structure:

- **Goals** –Broad statements describing community desires
- **Policies / Measures** –Specific position statements that support the achievement of goals and serve as guides to the City when making decisions
- **Actions** –Specific methods to implement and achieve policies and goals.



Potential Adaptation Goals

Goal 1. A Healthy, Safe, and Resilient Community

Goal 2. A Natural Environment Resilient to Climate Hazards

Goal 3. Resilient Infrastructure and Built Environment



Goal 1. A Healthy, Safe, and Resilient Community

Policy 1.1. Provide effective emergency preparedness and response in anticipation of potential climate-related disasters.

- Improve Emergency Preparedness by incorporating Climate Change risk in CERT programming
- Collaborate with Monterey Fire on inspection and outreach for fire risk reduction
- Publicize Local Evacuation Routes
- Maintain and Update Evacuation Plan
- Evacuation Access for residents with disabilities
- Evaluate Evacuation Route Capacity
- Evacuation Alternative
- Update City Planning Guidelines in the Fire Hazard Zones
- Development Standards in the Fire Hazard Zones.
- Increase Resistance to Wildfire Structural Damage.



Goal 1. A Healthy, Safe, and Resilient Community

Policy 1.2. Focus adaptation efforts and engagement on the most vulnerable populations.

- Establish a Resilience Hub
- Limit the Impacts of Climate Change on the Most Vulnerable Populations
- Educate the Community
- Social Support Network
- Back-up Power for Vulnerable Populations



Goal 1. A Healthy, Safe, and Resilient Community

Policy 1.3. Minimize health impacts of climate change.

- Partner with Monterey County Health Department
- Initiate a Heat Pump Retrofit Program
- Improve Resilience in Critical Facilities
- Conduct a Feasibility Study for Existing Building Electrification
- Improve Resilience in Housing Stock
- Electrify Fireplaces
- Identify Funding and Financing



Goal 1. A Healthy, Safe, and Resilient Community

Policy 1.4. Increase Economic Resilience

- Support Displaced Workers
- Establish Partnerships to Develop a Resilient Economy
- Business Resilience Outreach Program



Forum: Adaptation Strategies for Community Resilience

- Did we miss anything?
- Which policies and actions should be prioritized for Community Resilience?



Forum: Envision Sustainable Carmel in 2050

Mural Notes/Exercise



Goal 2. A Natural Environment Resilient to Climate Hazards

Policy 2.1. Protect and restore climate-vulnerable habitat and ecosystems.

- Increase Funding for Climate Adaptation
- Increase Forest Resilience and Update the Forest Management Plan
- Update the Mission Trail Nature Preserve Master Plan to increase resilience
- Increase Resilience of the North Dunes
- Increase Resilience to Stronger Storms by sizing improvements for larger storms
- Beach Sand Monitoring Program
- Carmel Cove Sand Supply Analysis



Forum: Adaptation Strategies for Natural Environment Resilience

- Did we miss anything?
- Which policies and actions should be prioritized for Natural Environment Resilience?



Forum: Envision Sustainable Carmel in 2050

Mural Notes/Exercise



Goal 3. Resilient Infrastructure and Built Environment

Policy 3.1. Support greater resilience, redundancy, and reliability of local and regional infrastructure and the built environment.

- Evaluate Undergrounding Utilities in Fire Hazard Zones
- Increase Green Infrastructure
- Reduce Stormwater Runoff
- Storm Drain Repair Funding and Improvements
- Retrofit Existing Critical Buildings and Related Infrastructure to handle Climate Hazards
- Water Conservation
- Bluff Structural Monitoring Program.
- Hire Coastal Engineer to evaluate coastal protection infrastructure.
- Wastewater Treatment



Goal 3. Resilient Infrastructure and Built Environment

Policy 3.2. Incorporate climate change adaptation into relevant plans and standards.

- Develop a Guidance Project Checklist
- Incorporate Climate Change Adaptation into Local Plans
- Update Shoreline Management Plan
- Multi-Jurisdictional Hazard Mitigation Plan



Forum: Adaptation Strategies for Infrastructure Resilience

- Did we miss anything?
- Which policies and actions should be prioritized for Infrastructure Resilience?



Forum: Envision Sustainable Carmel in 2050

Mural Notes/Exercise



Greenhouse Gas Reduction Policies for the Built Environment

Goal 1/3: Increase Energy Efficiency in Existing Residential and Commercial Units

- Energy Efficiency education and recognition in the residential and commercial sectors.
- Increase participation in energy efficiency programs.
- Home / Business Energy Evaluations.
- Residential home / Commercial energy renovations.
 - Promote participation in green building programs.
 - Provide incentives to homeowners / businesses to convert to electrification.
 - Streamline the permitting process for energy efficiency retrofits.
 - Require green building programs for large commercial renovations



Greenhouse Gas Reduction Policies for the Built Environment

Goal 2/4: Increase Energy Efficiency in New Residential / Commercial Units

- Educate City staff and the community on future Title 24 compliance.
- Promote Tier 1 and Tier 2 Green Building Standards.
- Require electrification in new residential units.
- Require electrification in new commercial units (exceptions for businesses that show need for NG).
- Streamline the permitting process for Tier 1 and Tier 2 Green Building applications

Goal 9: Increase Clean Energy Use

- Incentivize solar panel installation for residential and small commercial.
- Promote energy storage systems installation with solar panels.
- Require large commercial renovations to install solar panels.
- Encourage residents and businesses to participate in the 3CE 100 percent renewable Program.



Forum: Greenhouse Gas Reduction Policies for the Built Environment

- Did we miss anything?
- Which policies and actions should be prioritized?



Forum: Envision Sustainable Carmel in 2050

Mural Notes/Exercise



Greenhouse Gas Reduction Policies

Goal 5: Energy Efficiency Through Water Conservation

- Exceed State Water Efficiency Standards.
- Recycled water for certain types of commercial and multi-family landscaping.
- Grey Water Systems.
- Promote rainwater harvesting.

Goal 6: Decrease Energy Demand by Reducing the Heat Island Effect.

- Maintain the health of the Urban Forest Canopy.
- Modify codes to allow light reflecting surfaces on rooftops (cool roofs).
- Where feasible, use cool pavement options when repaving roadways.



Greenhouse Gas Reduction Policies

Goal 7: Decrease GHG Emission By Reducing VMT.

- Develop Bicycle Master Plan.
- Ride Sharing and Bike to Work Programs.
- Electric Vehicle Infrastructure.
- Neighborhood Electric Vehicles (NEV) and NEV Shuttles.
- Shuttle service between the Monterey Airport and destinations in the City.

Goal 8: Reduce Solid Waste

- Promote Zero Waste events.
- Promote home composting.
- Promote reusable containers rather than recyclables.
- Educate the community on use of City provided containers.



Forum: Greenhouse Gas Reduction Policies

- Did we miss anything?
- Which policies and actions should be prioritized?



Forum: Envision Sustainable Carmel in 2050

Mural Notes/Exercise



Next Steps

- Refine Strategy Tables based on feedback from the Workshop
- Develop cost ranges and implementation timelines, and identify primary implementation parties
- Finalize Climate Adaptation and Action Plans





CITY OF CARMEL-BY-THE-SEA

Thank you for participating!

Contact for comments:
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