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Exploring the Interaction between California's Greenhouse Gas Cap-and-Trade Program and "Complementary" GHG Emissions Reduction Policies

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EPRI Analysis of "Complementary Policies"

- EPRI report published March 2013 (**EPRI Doc. #3002000298**)
- Describes "complementary policies" adopted in CA, and potential impact of these policies on the operation of the GHG cap-and-trade program
- Available free online: http://my.epri.com/portal/server.pt?Abstract_id=000000003002000298

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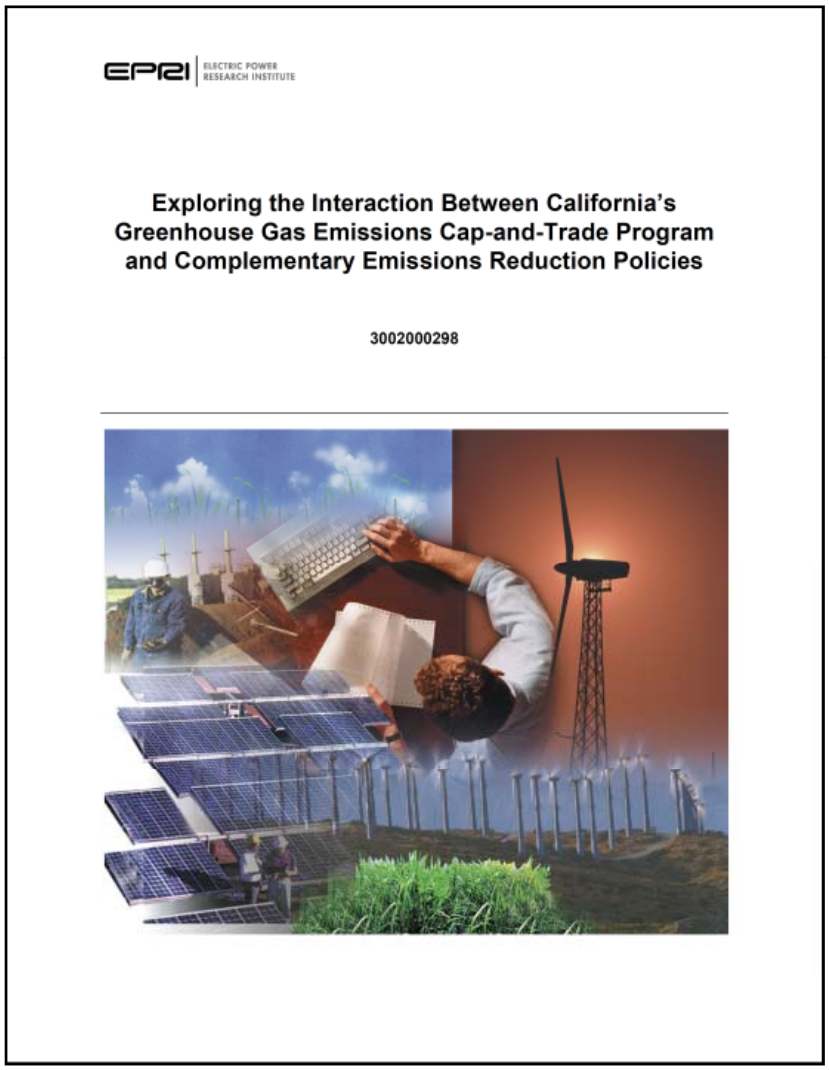
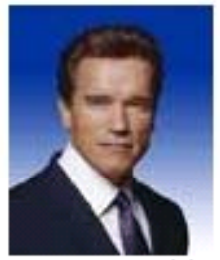


Key Insights

- The combination of CPs with C&T is not unique to California.
- Analysts differ on the efficacy of combining CPs and C&T.
- Expected GHG abatement in the C&T program is highly uncertain, ranging from 97-395 $MtCO_2e$ (2013-2020), and depends on: (i) APCR; (ii) offset usage, and (iii) success of complementary policies.
- Total allowable offset supply is 218 Mt. Offsets could account for 55-80% of total abatement, depending on use of the APCR.
- The relative success of CP's in reducing GHG emissions will impact the amount of abatement required to achieve the cap, and allowances prices.
- Electric sector compliance "short" is directly affected by the performance of all of the CPs, including transportation sector CPs.
- CP's may increase net social cost of achieving AB-32 goals, as compared to a "pure" cap-and-trade program, but is likely to lead to lower "visible" CO_2 allowances prices.

California's GHG Mitigation Program

- Global Warming Solutions Act of 2006 (AB-32)
  - 1st economy-wide mandatory statewide GHG emissions cap adopted in the U.S.
  - 1990 statewide GHG emissions by 2020 (427 Mt CO_2e)



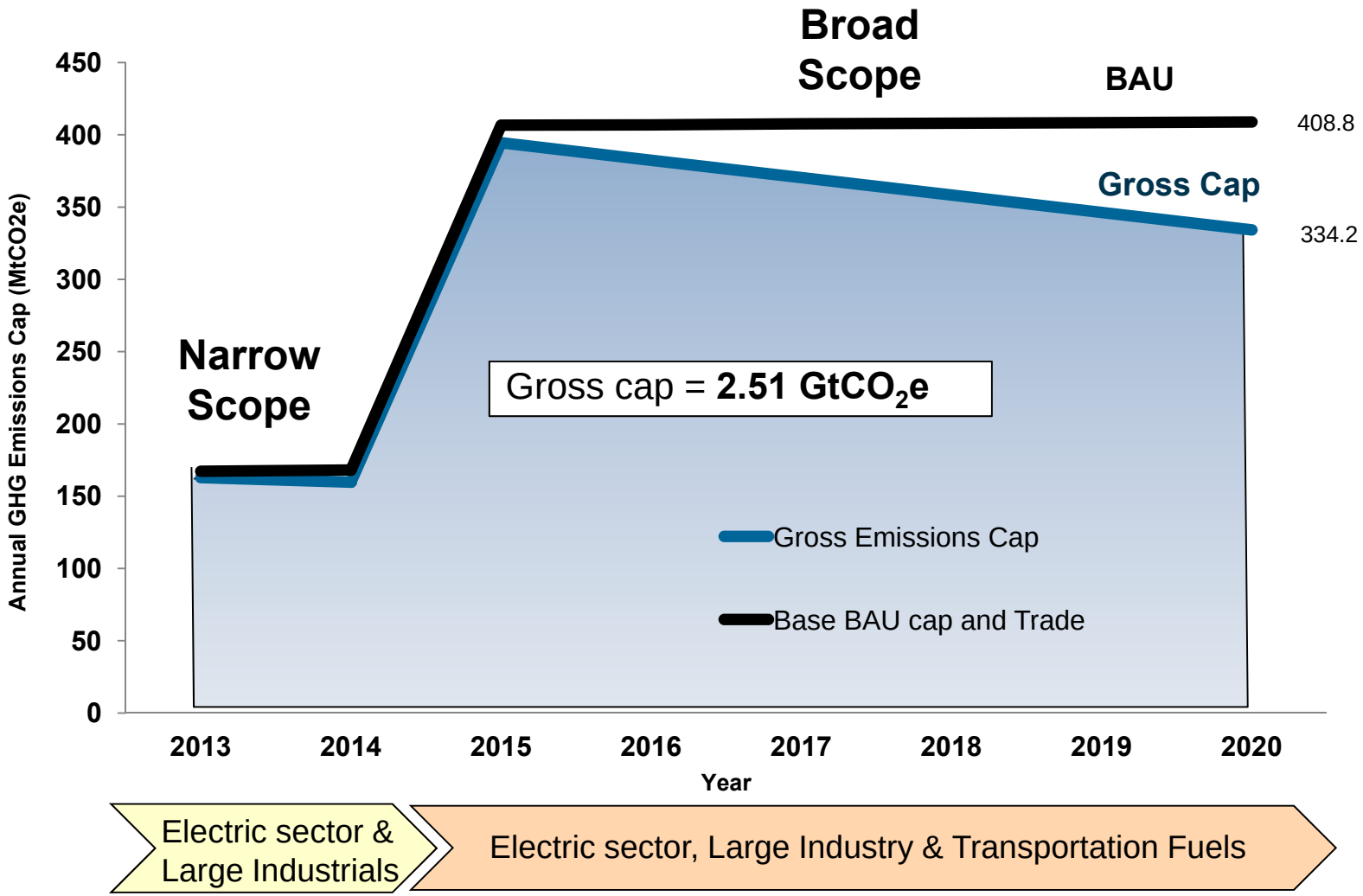
Gov. Arnold Schwarzenegger California

- **Direct regulatory measures,** also known as "complementary policies" (CPs), target emissions from key sectors, including transportation, electricity and industry (e.g., LCFS, RPS, EE)
- **Mandatory GHG cap-and-trade program (C&T)** with offsets
  - Cover ~85% of the state economy by 2015.
  - Compliance obligation began January1, 2013.
  - The "cap" accounts for 334 MtCO_2e of the 427 Mt CO_2e target in 2020.

California's Approach is not Unique

- Other regions and nations also have combined complementary policies with a C&T programs to address climate change, including
  - Quebec
  - Australia
  - European Union (EU)
- Waxman-Markey legislation (HR 2454) included EE standards and an RPS along with the C&T program
- If the U.S. adopts comprehensive climate policy in the future, it could utilize a similar approach as used in California

California CO_2 Emission BAU and Emissions-to-Gross Cap 2012-2020



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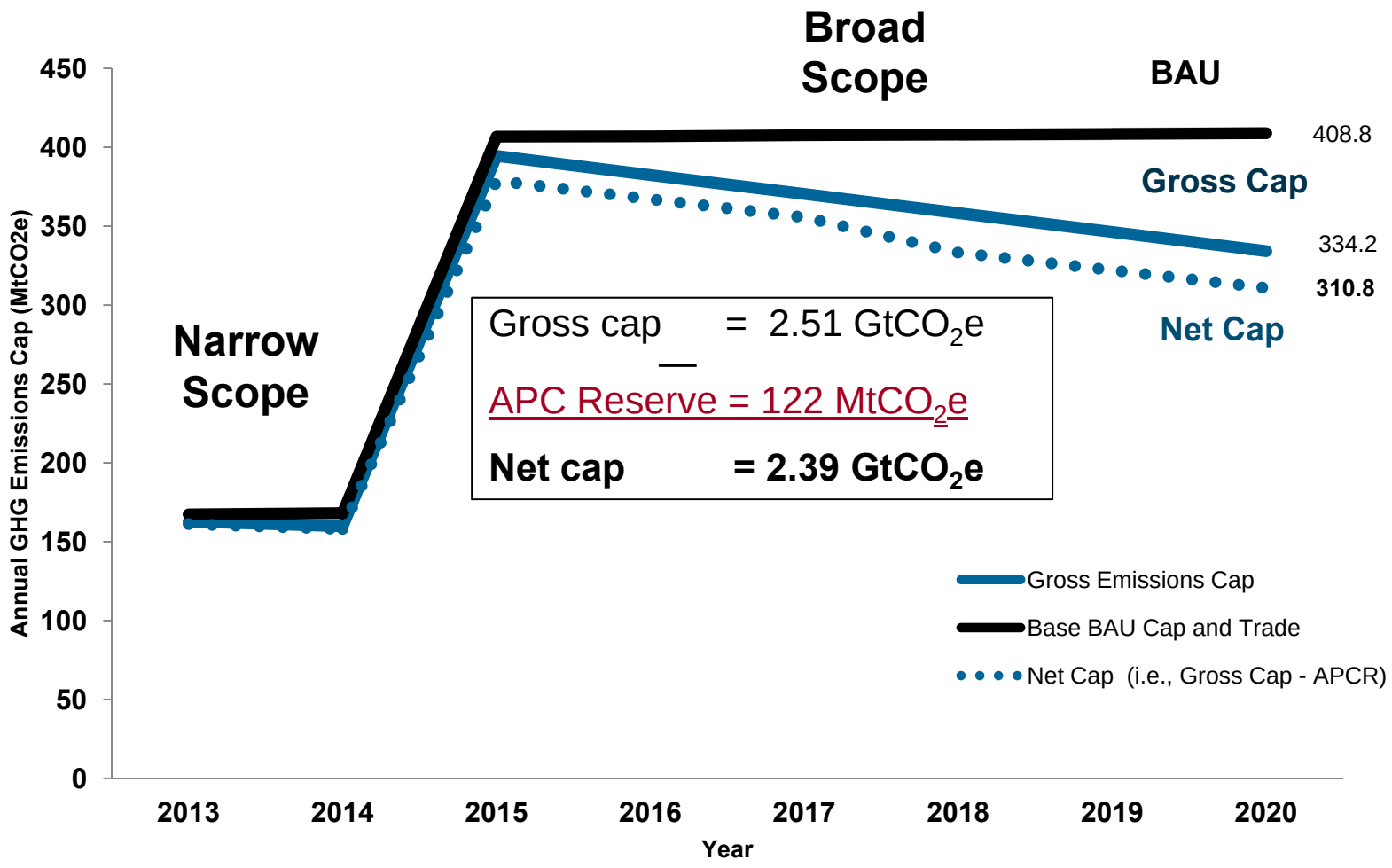
California CO_2 Emission BAU and Emissions-to-Net Cap 2012-2020



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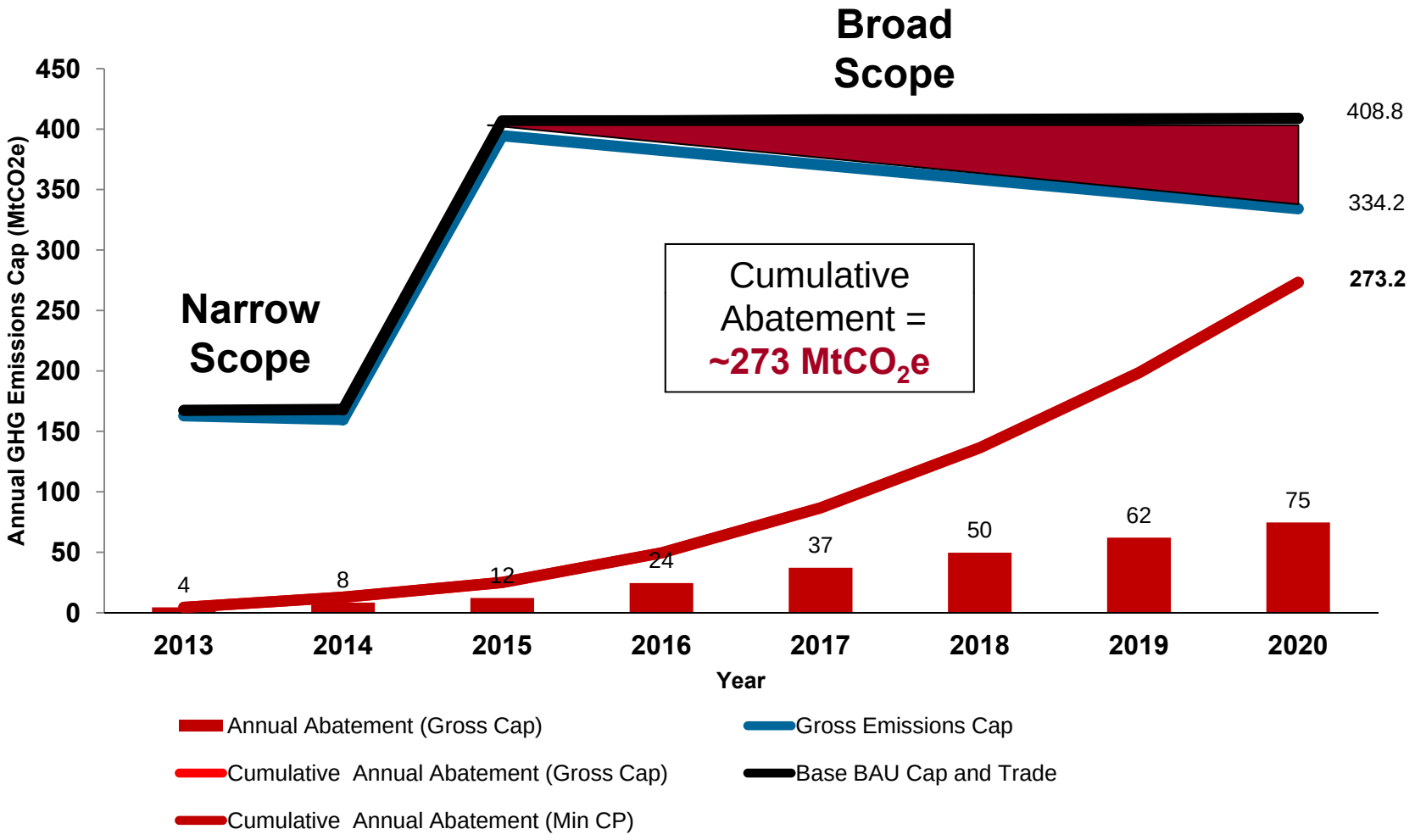
California GHG Emissions Abatement – Emissions-to-Gross Cap



Note: This level of abatement assumes the APCR is fully utilized by compliance entities.

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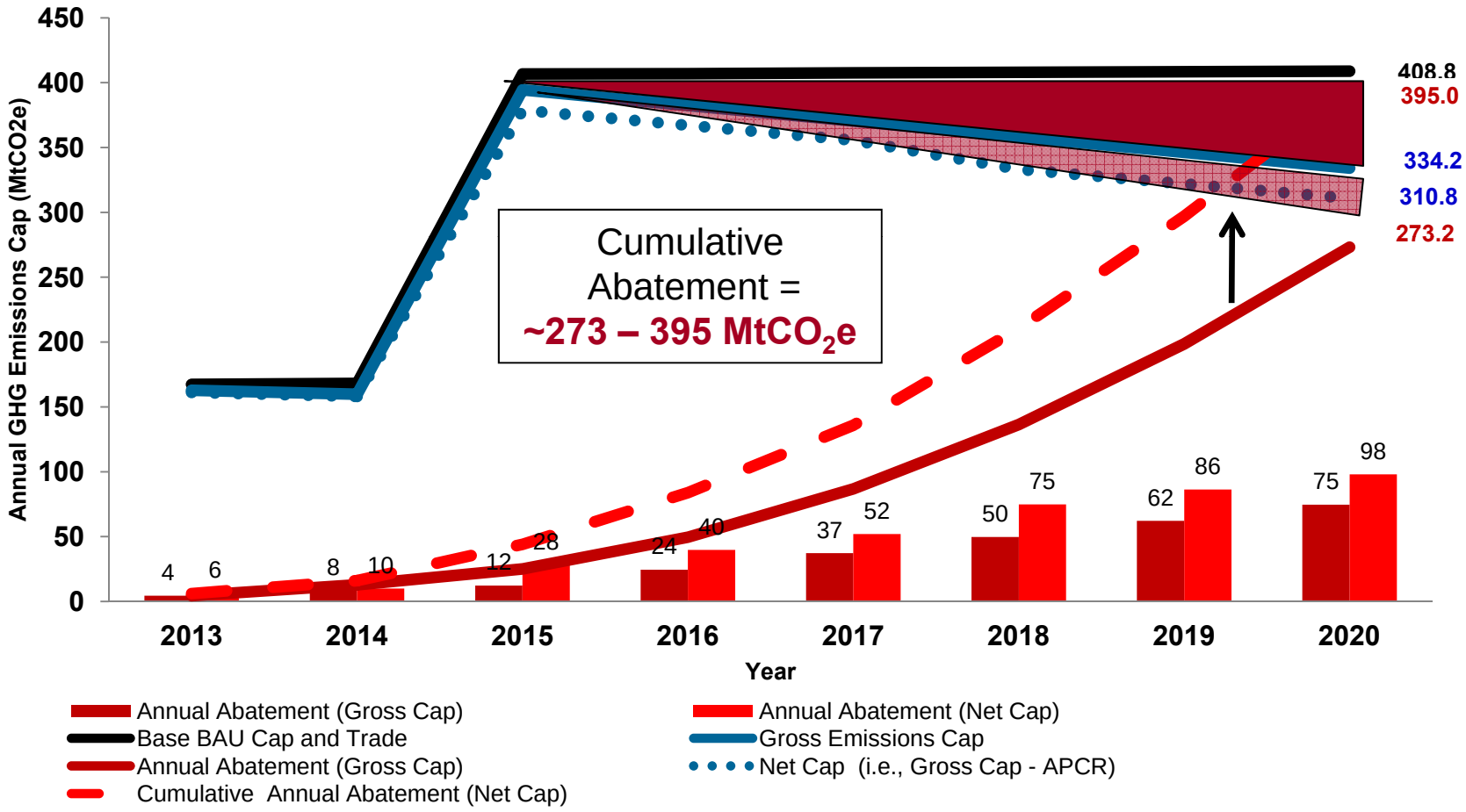
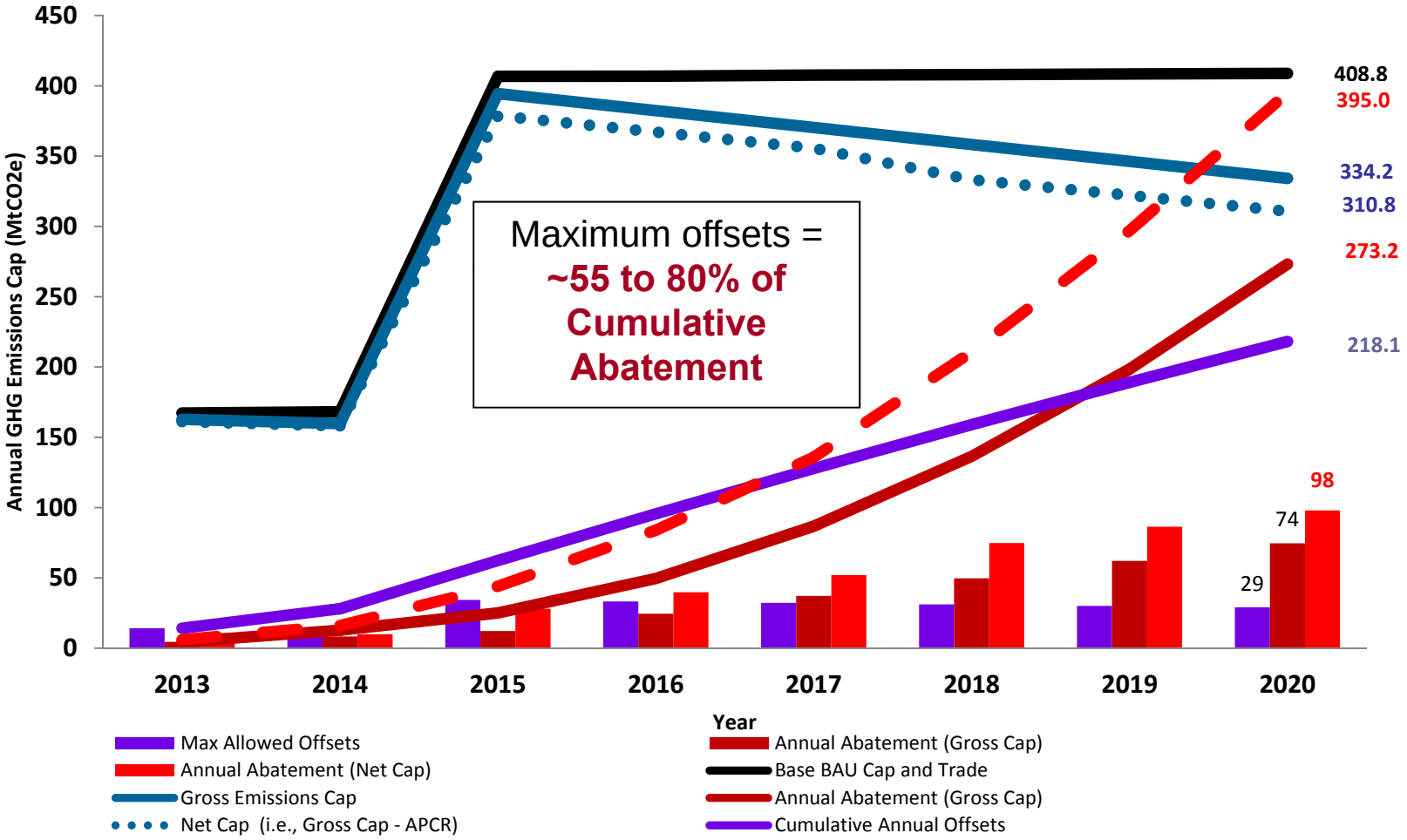
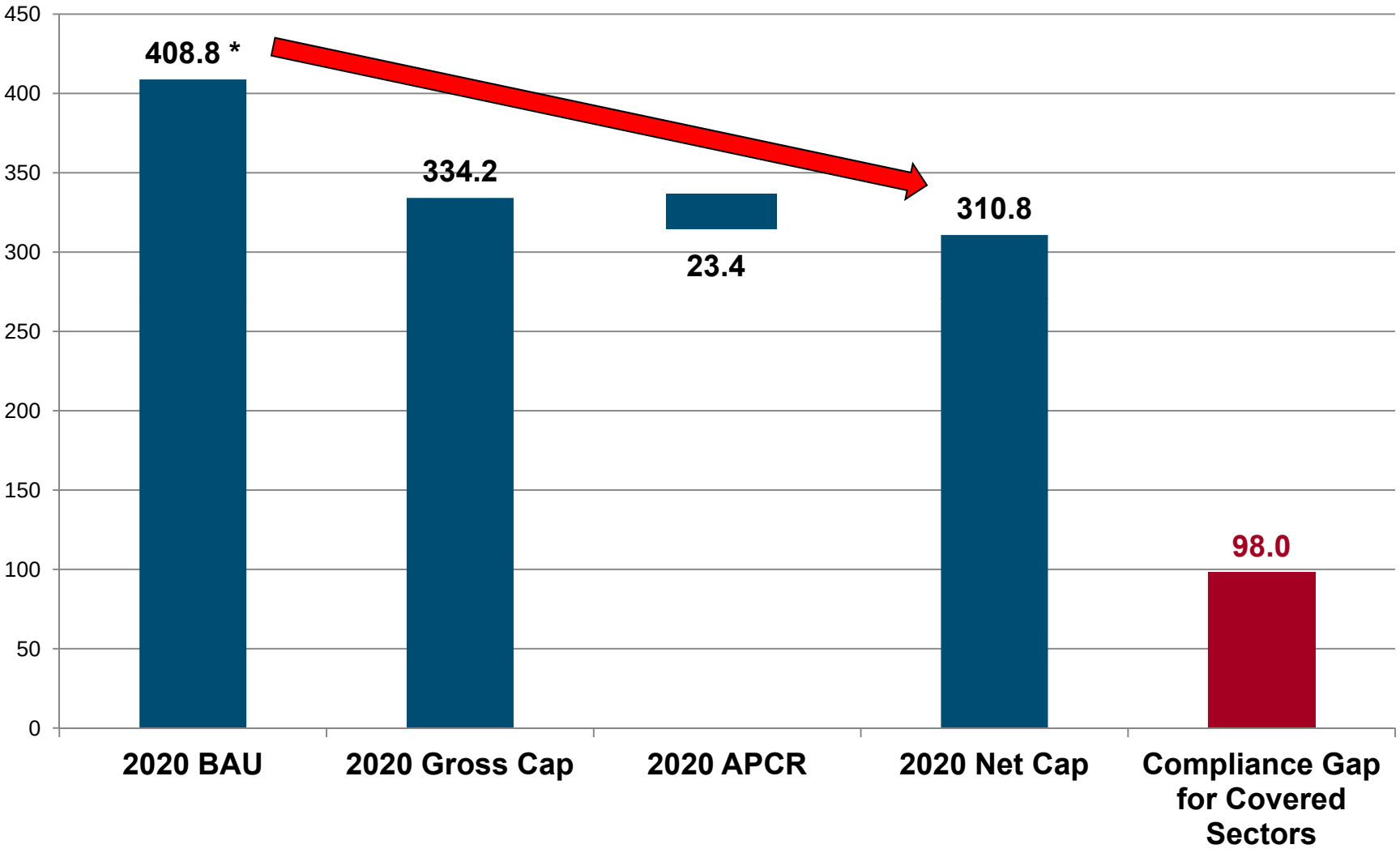
California GHG Emissions Abatement is Uncertain – *Gross Cap* and *Net Cap*



Offsets May Comprise 55% to 80% of Expected GHG Emissions Abatement (2013-2020)

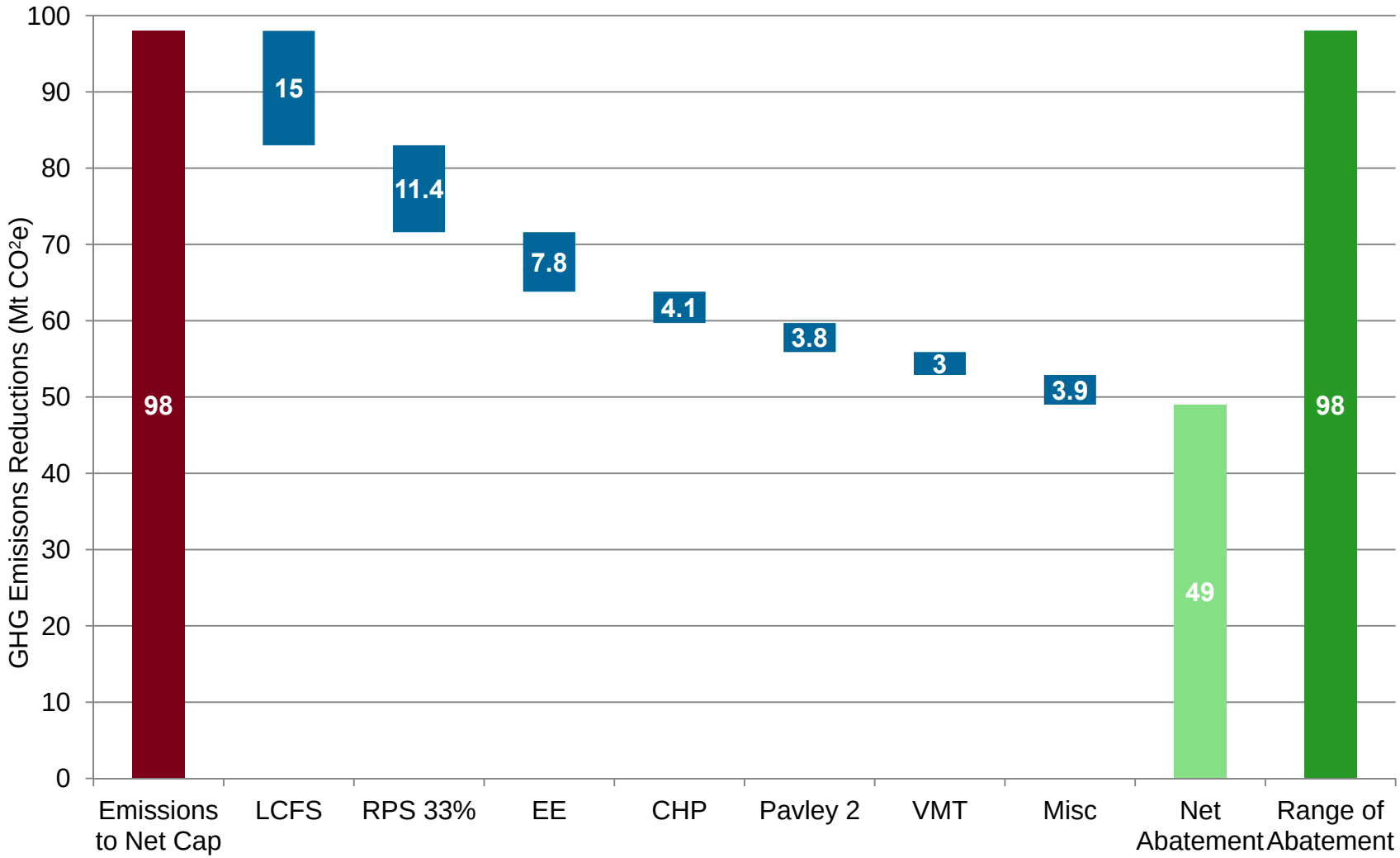


Estimated C&T Compliance Shortfall in 2020
Net Emissions-to-Cap (Mt CO_2e)



Source: http://www.arb.ca.gov/cc/inventory/data/tables/2020_ghg_emissions_forecast_2010-10-28.pdf

Required GHG Emissions Reductions and Key Role of Complementary Policies in 2020



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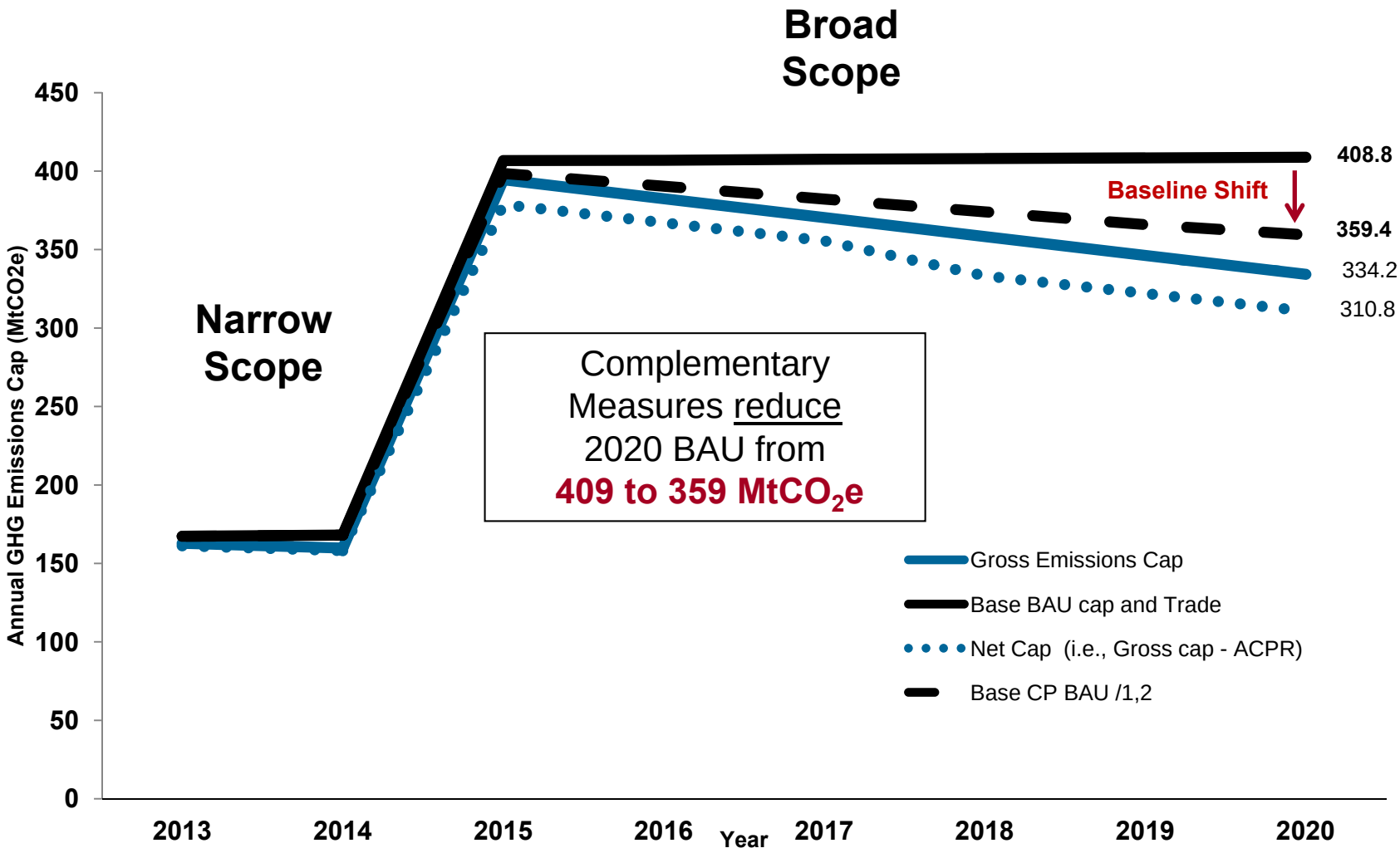
Complementary Measures Reduce Expected 2020 BAU Emissions



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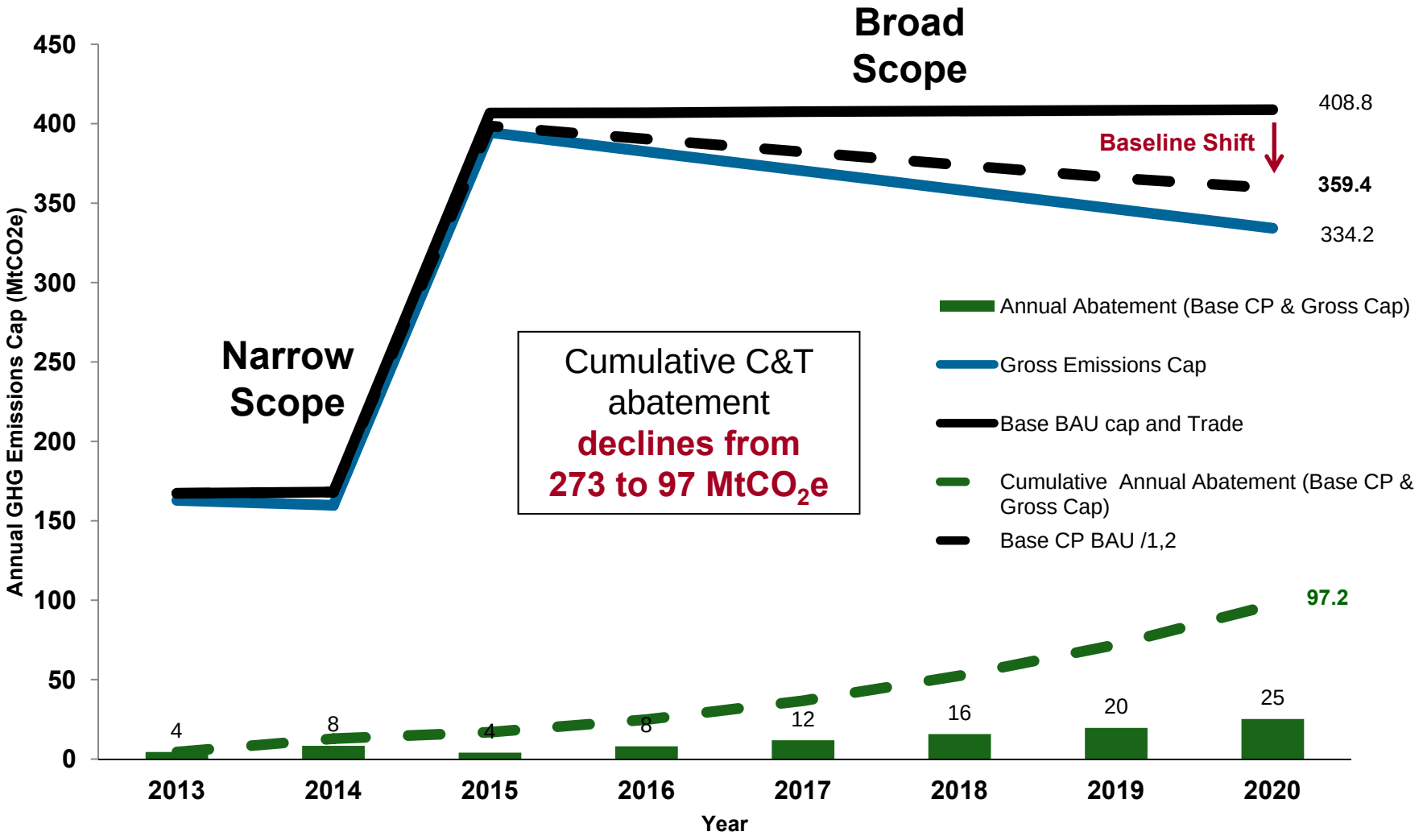
Required GHG Emissions Abatement (Base CP & *Gross* Cap)



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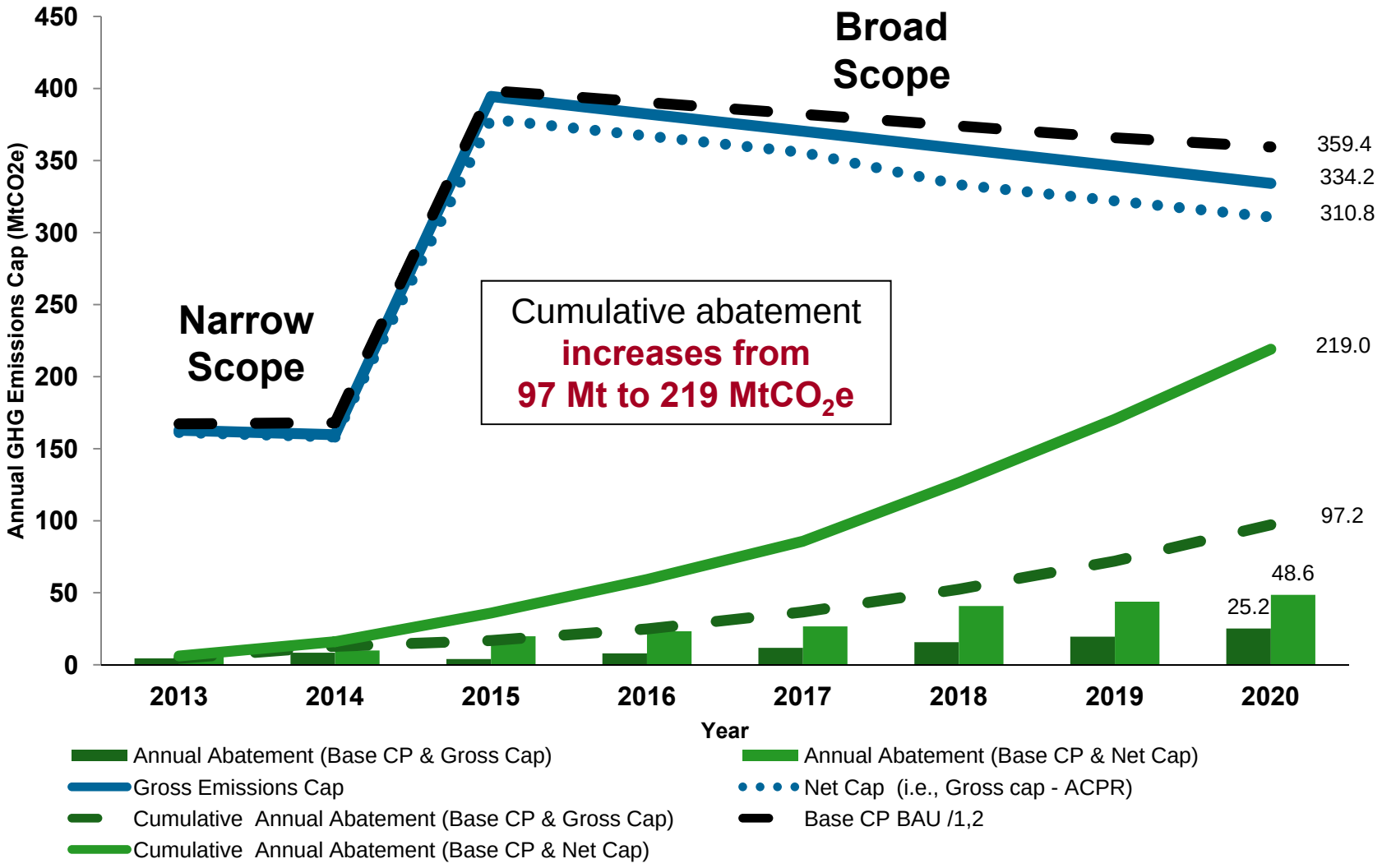
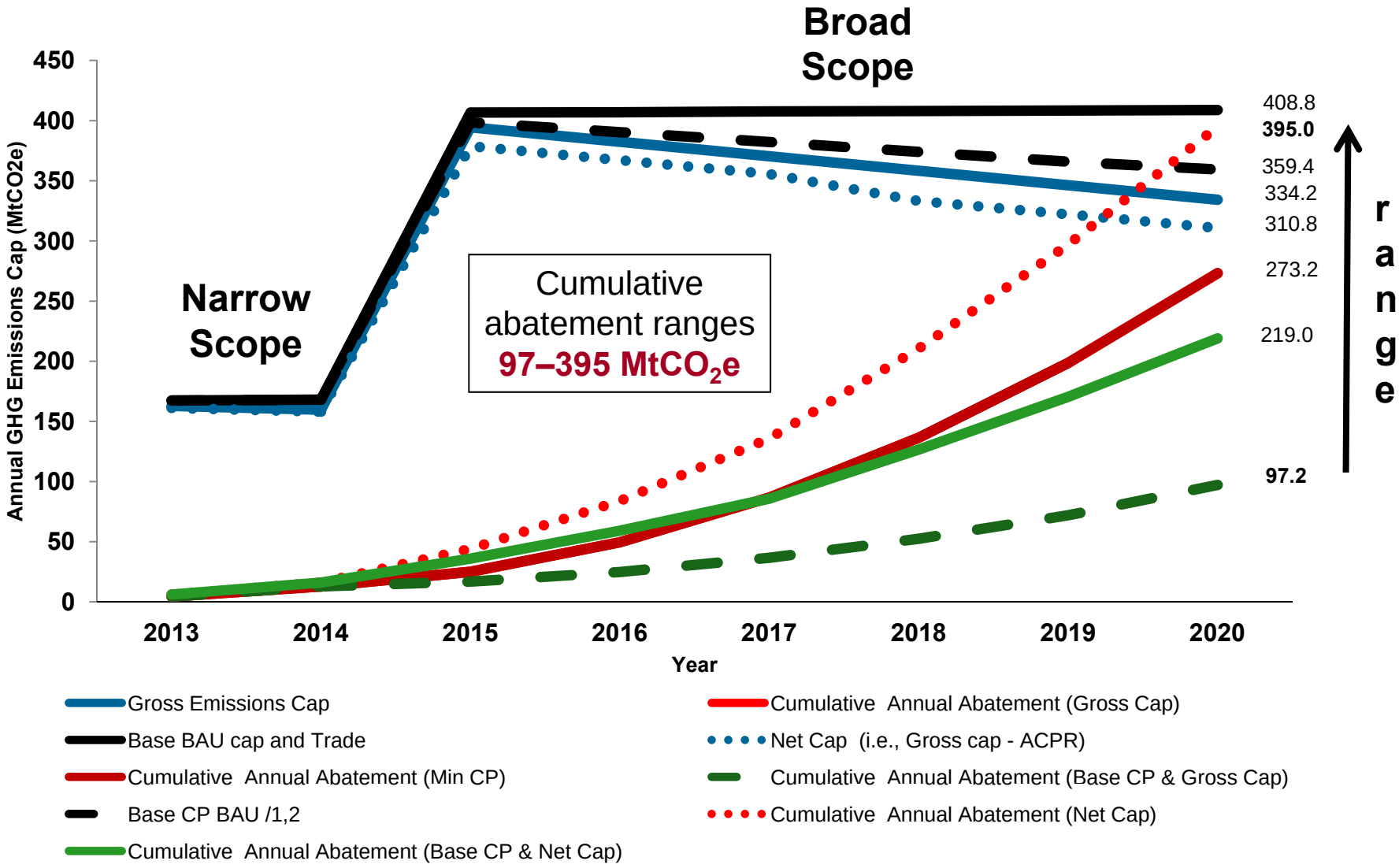
Required GHG Emissions Abatement (Base CP & *Net* Cap)



Required Abatement is Highly Uncertain



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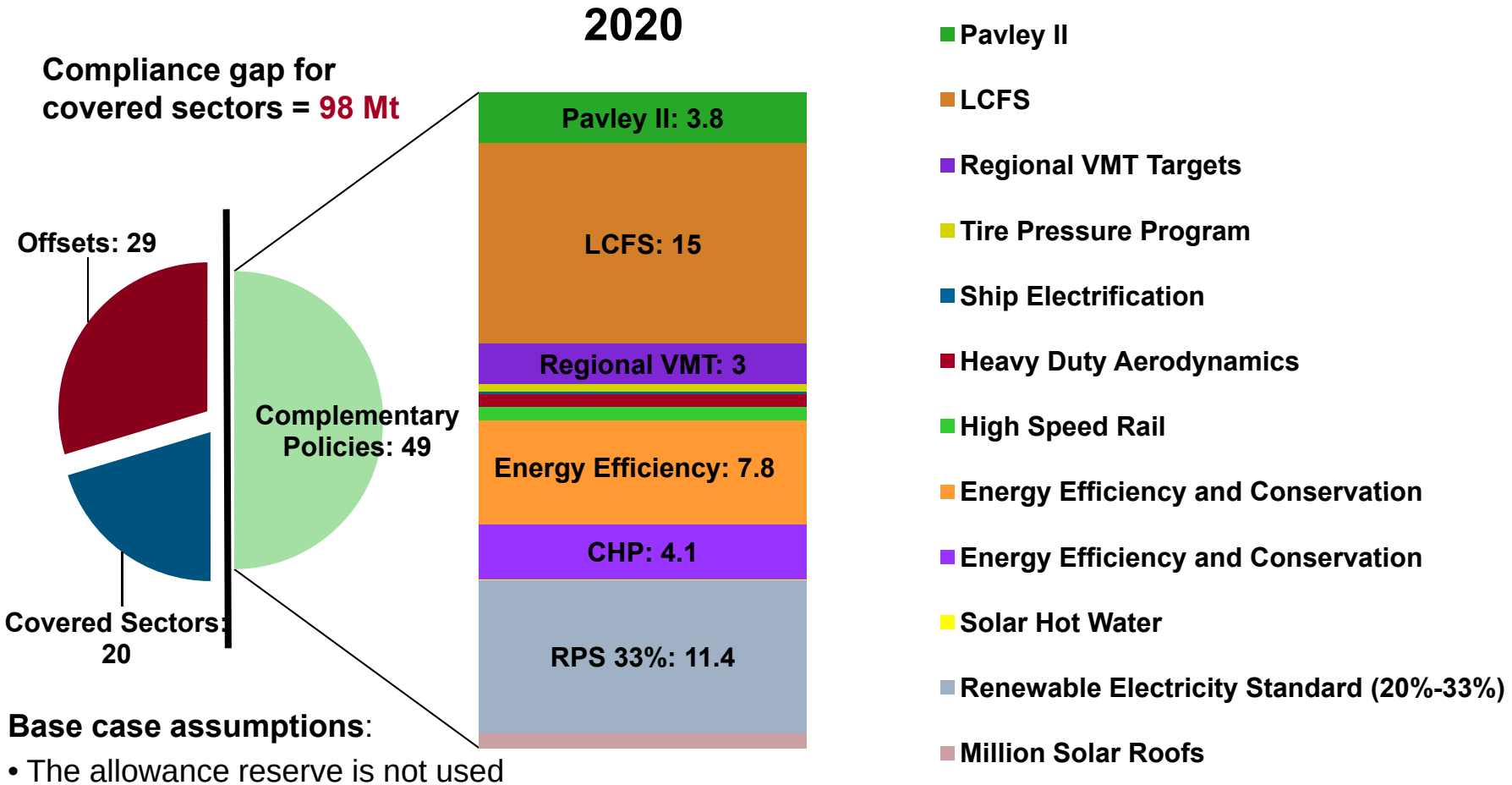
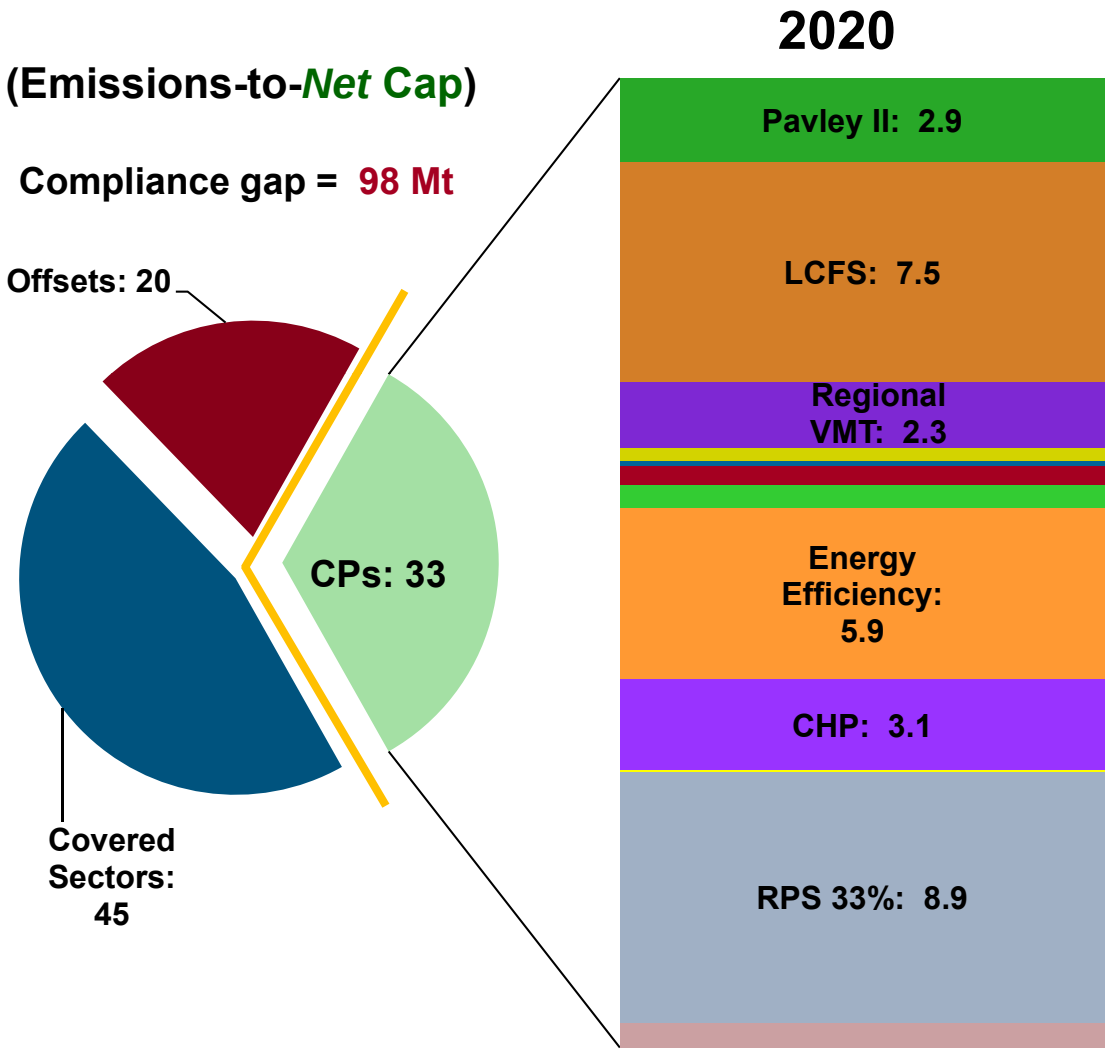
C&T Base Case Compliance Scenario (Emissions-to-*Net* Cap)



Base case assumptions:

- The allowance reserve is not used
- CPs achieve their targets (49 Mt of reductions) (some small reductions not labeled in stacked bar)
- The maximum volume of offsets (29 Mt in 2020) is available
- Covered sector abatement address the remaining gap = 20 Mt
- CPs account for 50% of compliance

C&T Compliance Scenario 1B:
CPs Underachieve & Lower Offsets*



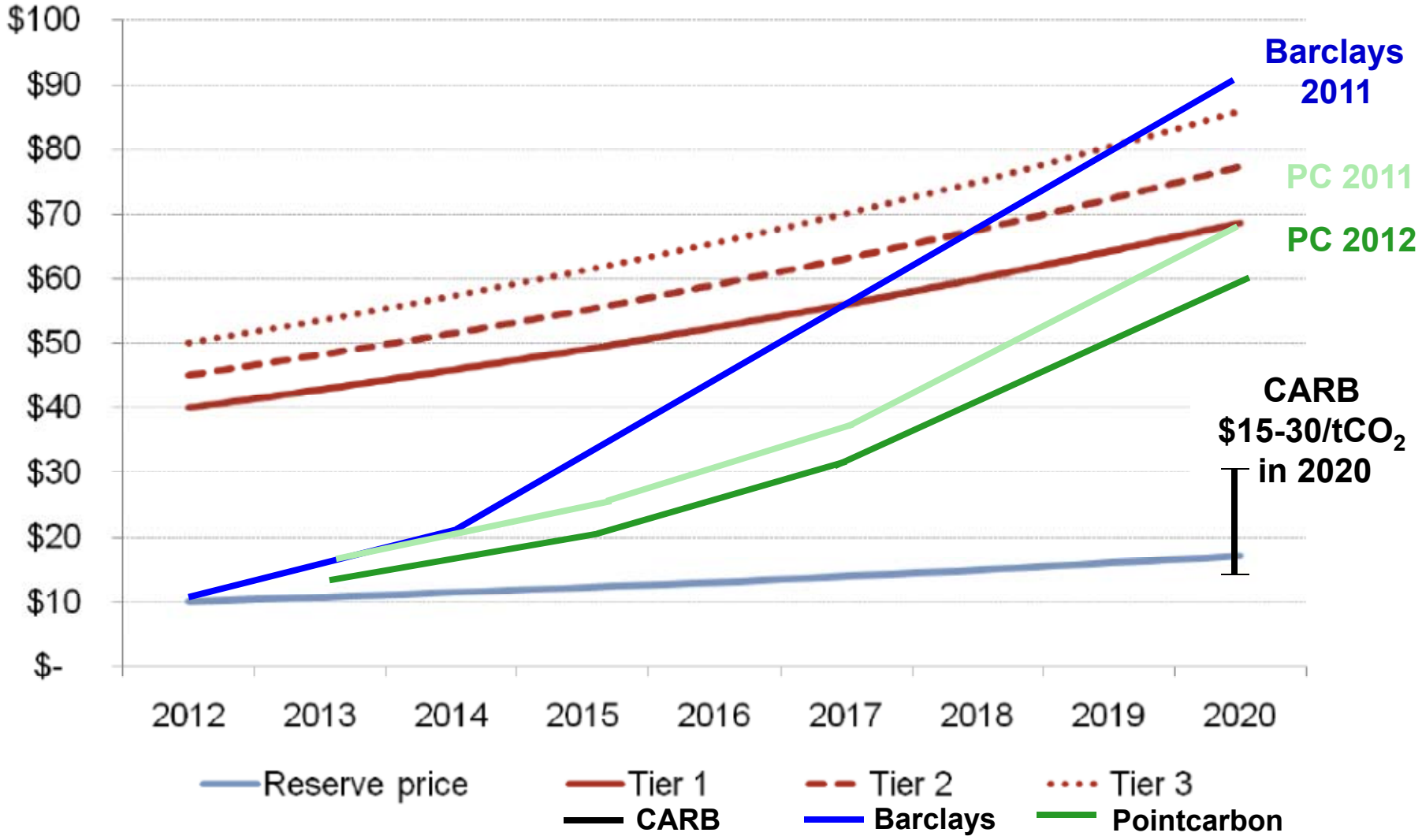
- CPs deliver 33 Mt
- Only 20 Mt of offsets is available
- Covered sectors must deliver ~45 Mt (126% more than base case)
- Allowance prices increase; up to reserve level?
- CPs account for 34% of compliance

* Scenario assumes APCR is not used

Interaction of Complementary Policies and Cap-and-Trade Program

- Potential for all CPs to achieve estimated emissions reductions is uncertain
- If CPs targeting emissions in covered sectors achieve ***fewer*** emissions reductions than ARB estimated…
  - Covered sector emissions will be **higher**
  - Allowance prices will **increase**
  - Dynamic is reinforced if offset supply or hydro/nuclear generation is lower than estimated, or if economic growth is higher than expected
- If these CPs achieve ***more*** reductions than estimated…
  - Covered emissions will be **lower**
  - Allowance prices will **decrease** (but, total social costs may increase)
  - Dynamic is reinforced if offset supply or hydro/nuclear generation is higher than expected, or if economic growth is lower than expected

Expected CA Allowance Prices May Depend on Offsets, CPs, APCR and Other Factors



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Thank You

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