



The Interaction of Complementary Policies and GHG Cap-and-Trade in California

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Together...Shaping the Future of Electricity

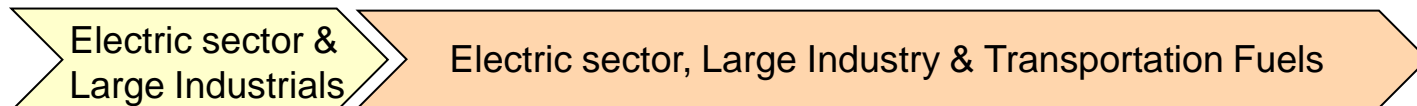
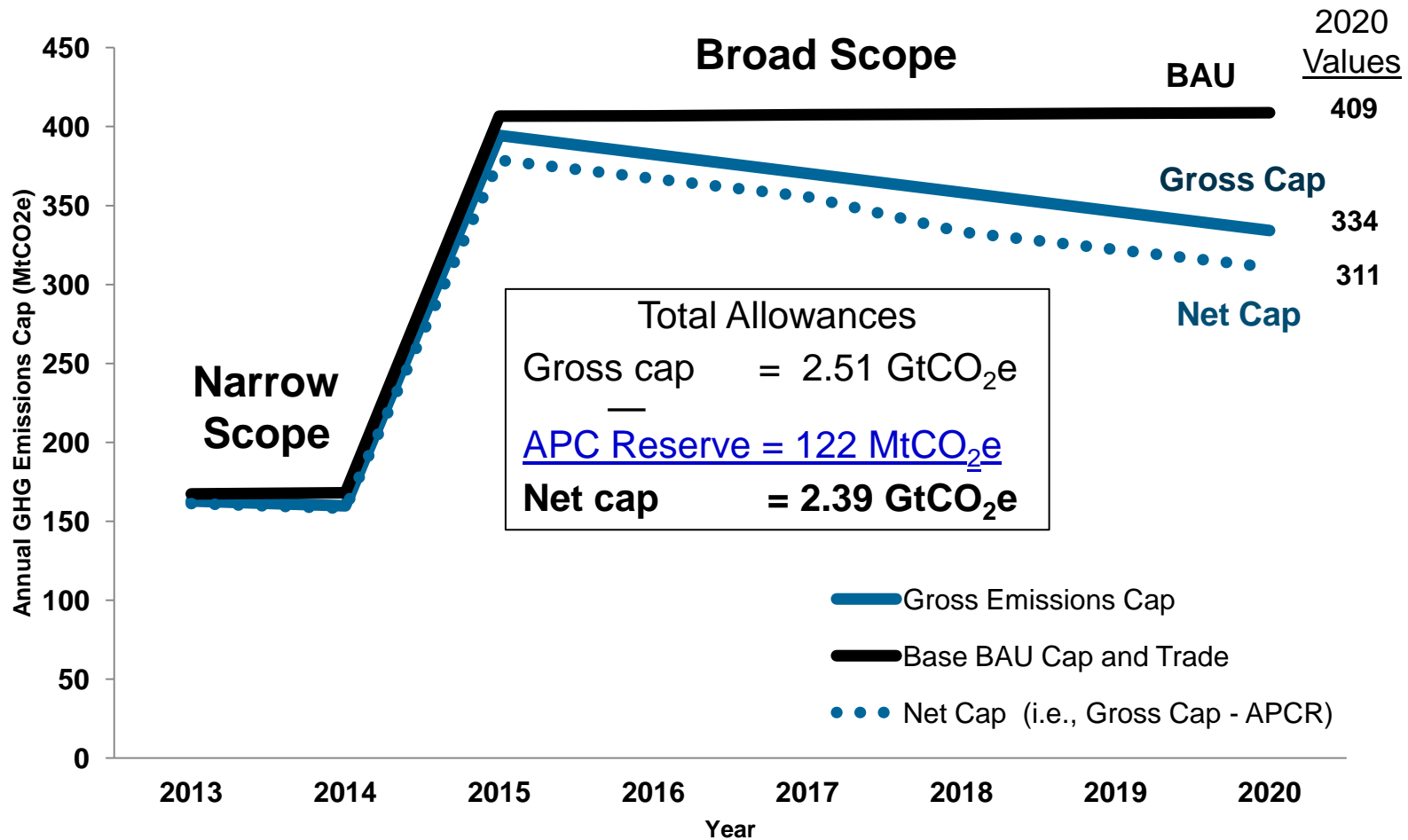


- EPRI is a non-profit scientific research consortium founded in 1973.
- EPRI performs objective research and development relating to the generation, delivery and use of electricity for the benefit of the public.
- EPRI has 450+ participants in more than 40 countries around the world.
- In the U.S., EPRI participants generate more than 90% of electricity delivered.

California's GHG Reduction Program Includes Both GHG Cap-and-Trade and Direct Measures

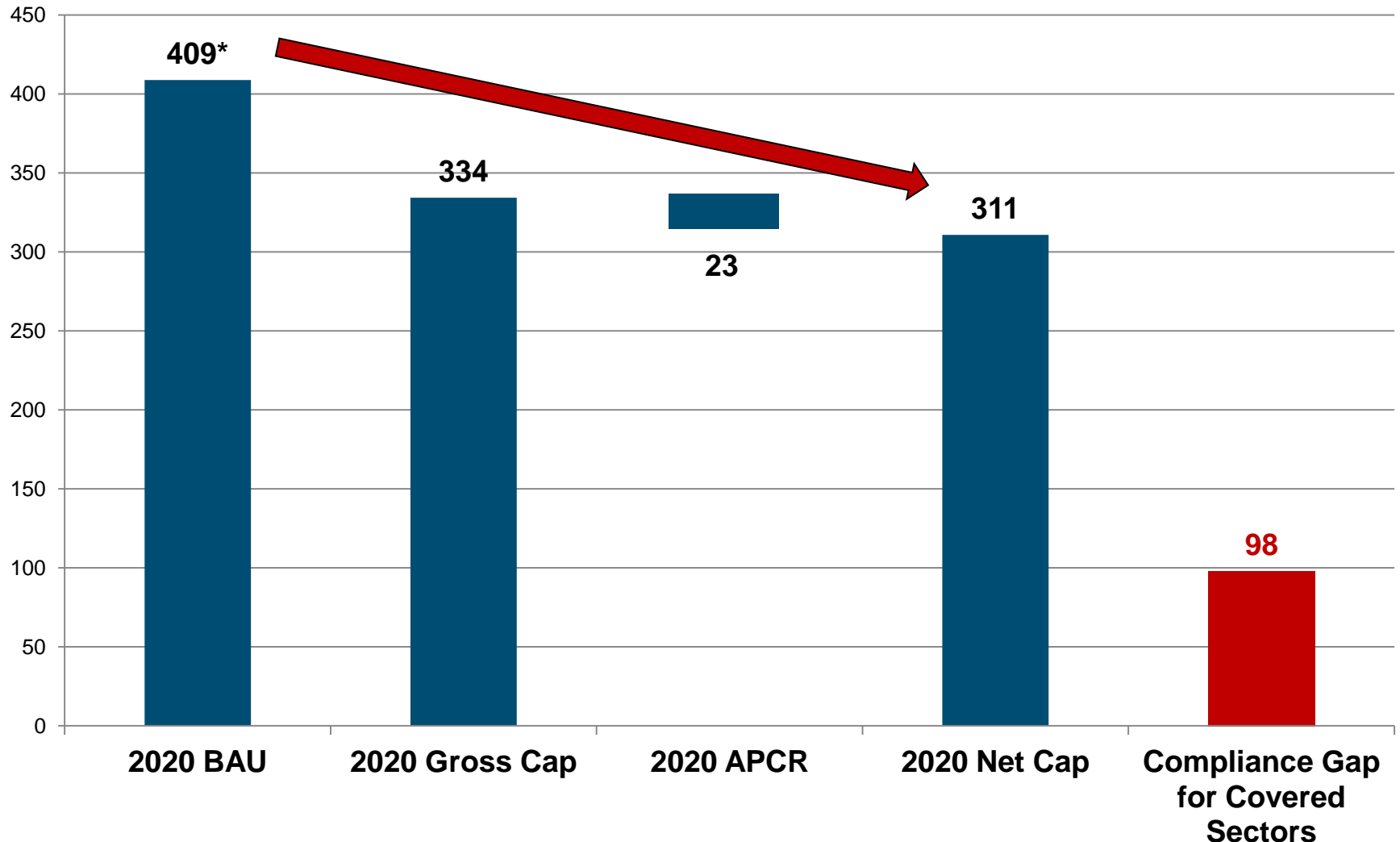
- Global Warming Solutions Act of 2006 (AB-32)
- **Target:** 1990 GHG emissions by 2020 (427 MtCO₂e)
- **Direct regulatory measures**, aka “*complementary policies*” (CPs), target emissions from key emitting sectors, including transportation, electricity, and industry (e.g., LCFS, RPS, EE)
- **GHG cap-and-trade program (C&T) with offsets**
 - Compliance obligation began January 1, 2013.
 - **Economy wide program** covers ~85% of the state's economy by 2015.
 - The “cap” accounts for **334 of the 427 MtCO₂e target** in 2020.
 - Offsets can be used up to a maximum of **8% of compliance obligation** during each compliance period. Total allowed = 218 MtCO₂e.
 - **Allowance Price Containment Reserve** (APCR) = 122 MtCO₂ of allowances in “escrow” until prices are >\$40/tCO₂e.

CA GHG Allowance Supply 2012-2020



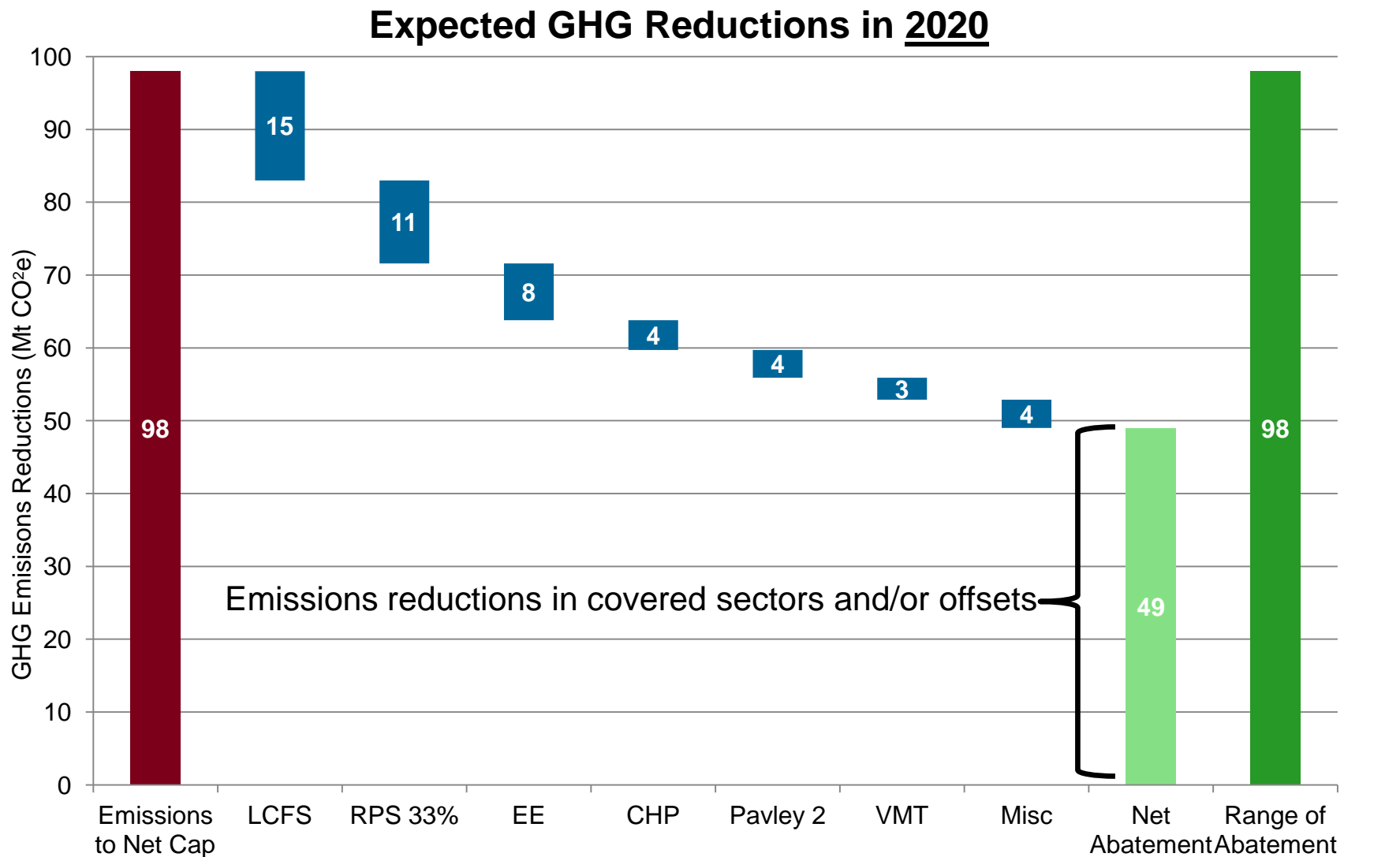
Estimated Annual C&T Compliance Shortfall 2020

Emissions-to-Net Cap (MtCO₂e)

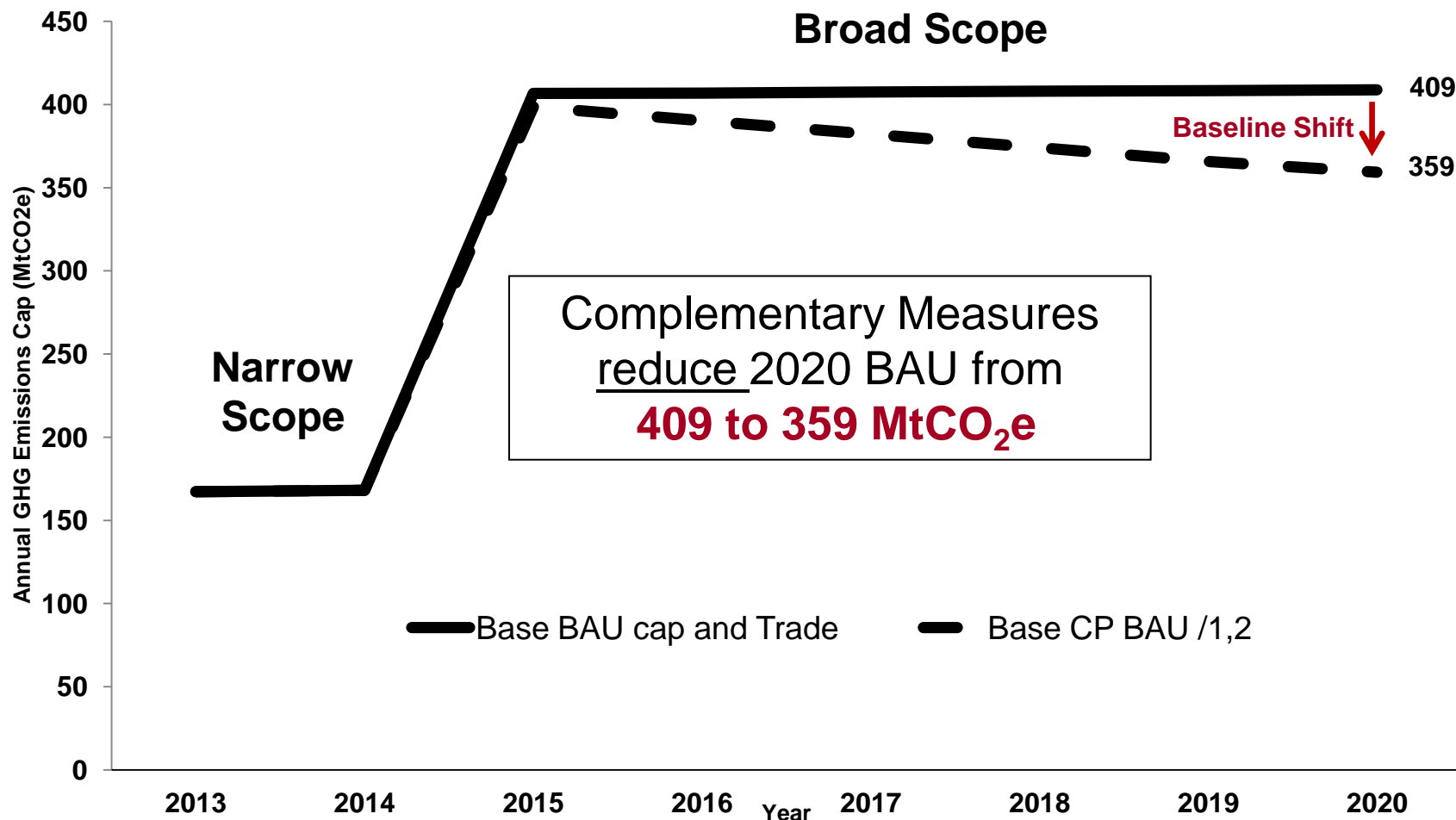


*Source: http://www.arb.ca.gov/cc/inventory/data/tables/2020_ghg_emissions_forecast_2010-10-28.pdf.

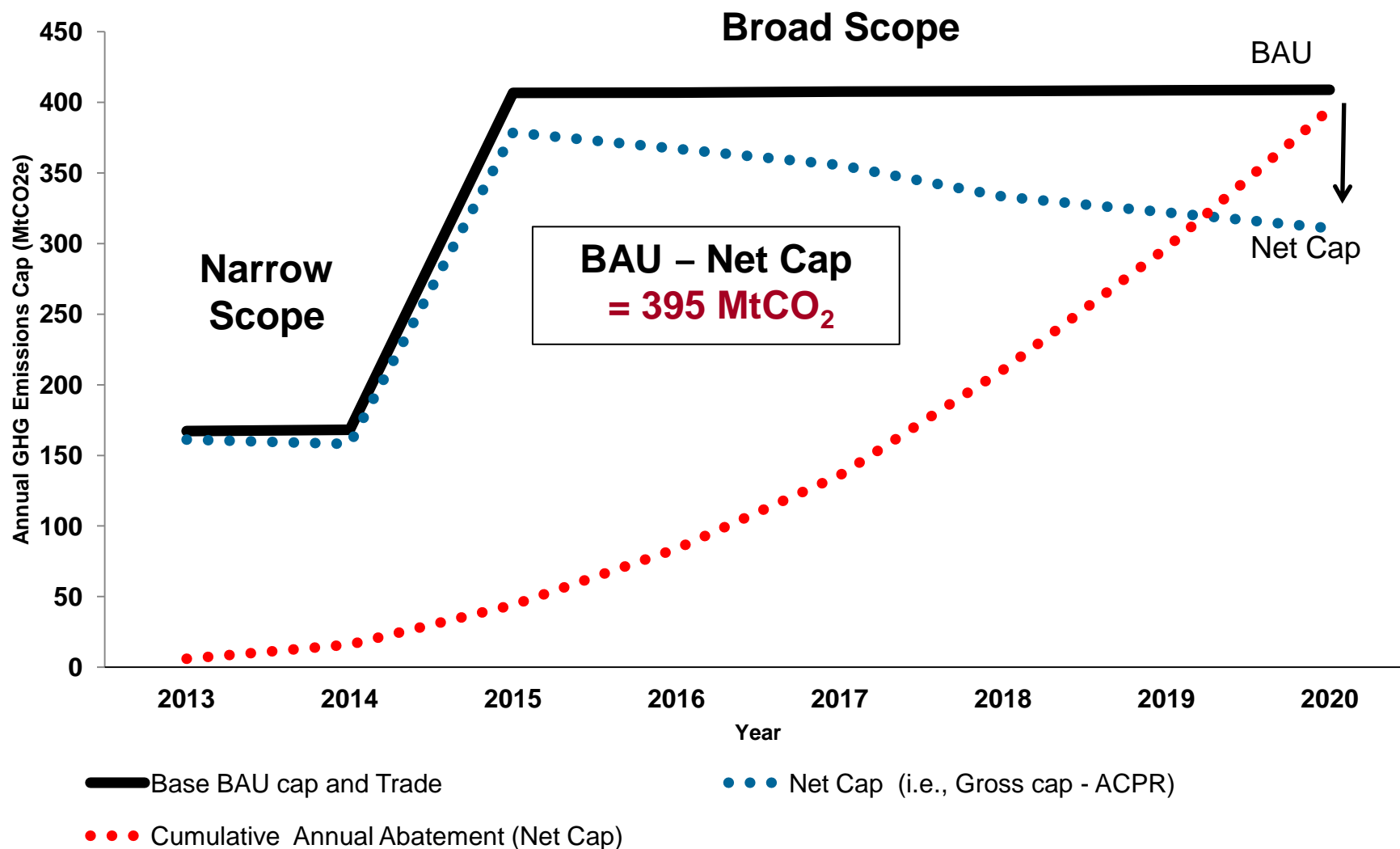
Carbon Pricing Designed to Provide a “Backup” for “Complementary” GHG Reduction Policies



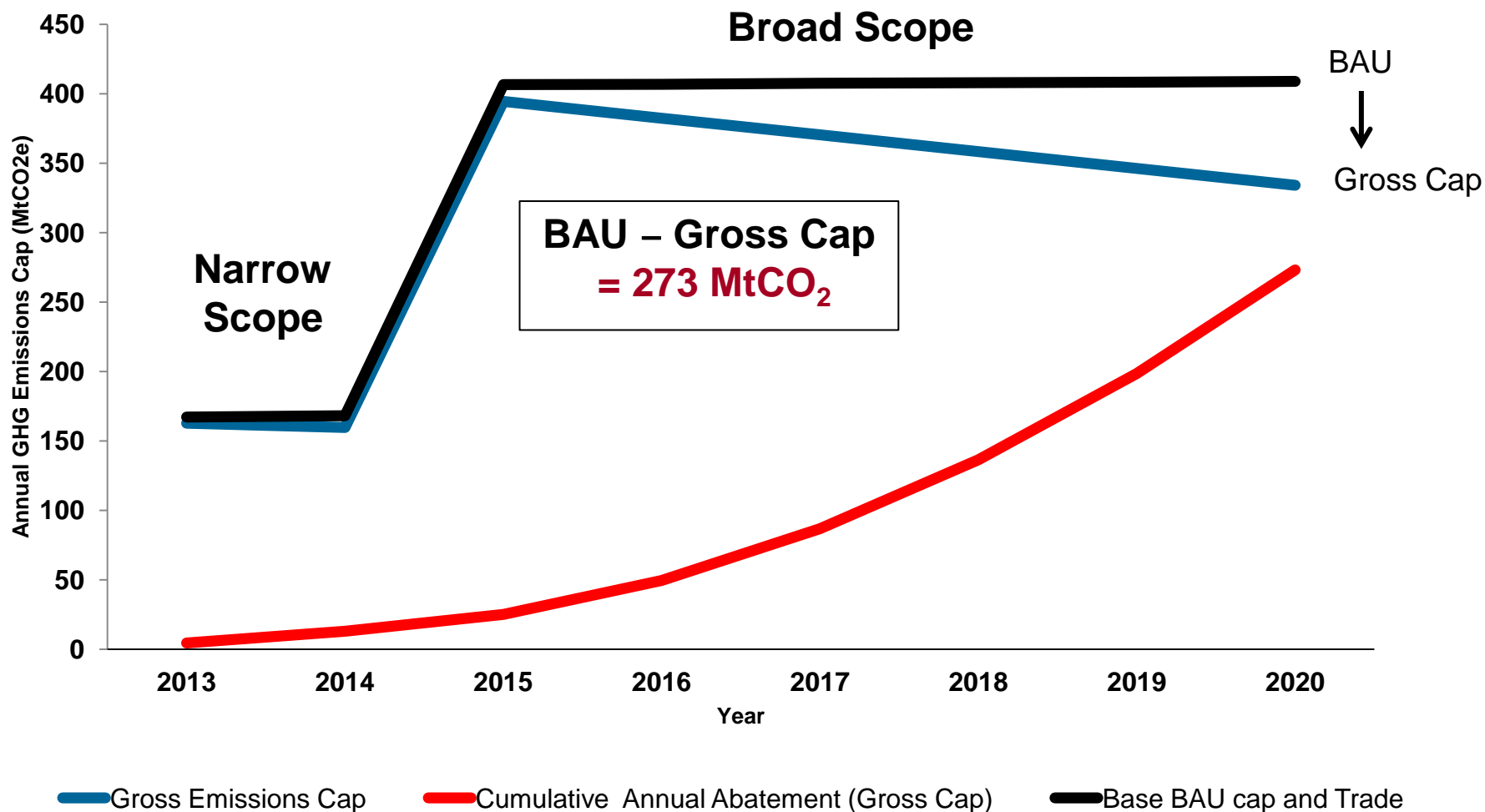
Complementary Measures *Reduce* Expected BAU Emissions Trajectory



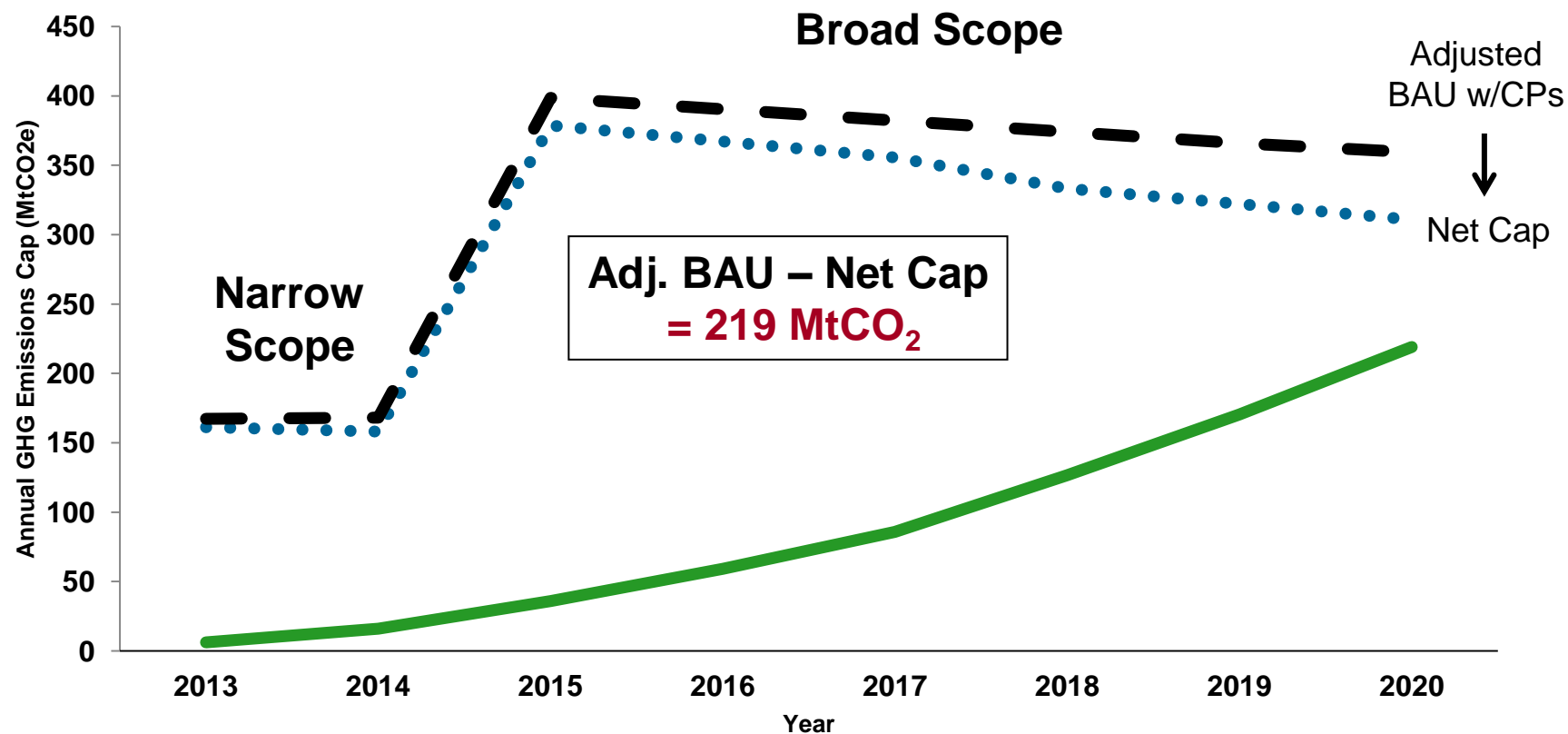
Cumulative Abatement in the C&T Program is Uncertain and Depends on CPs and APCR



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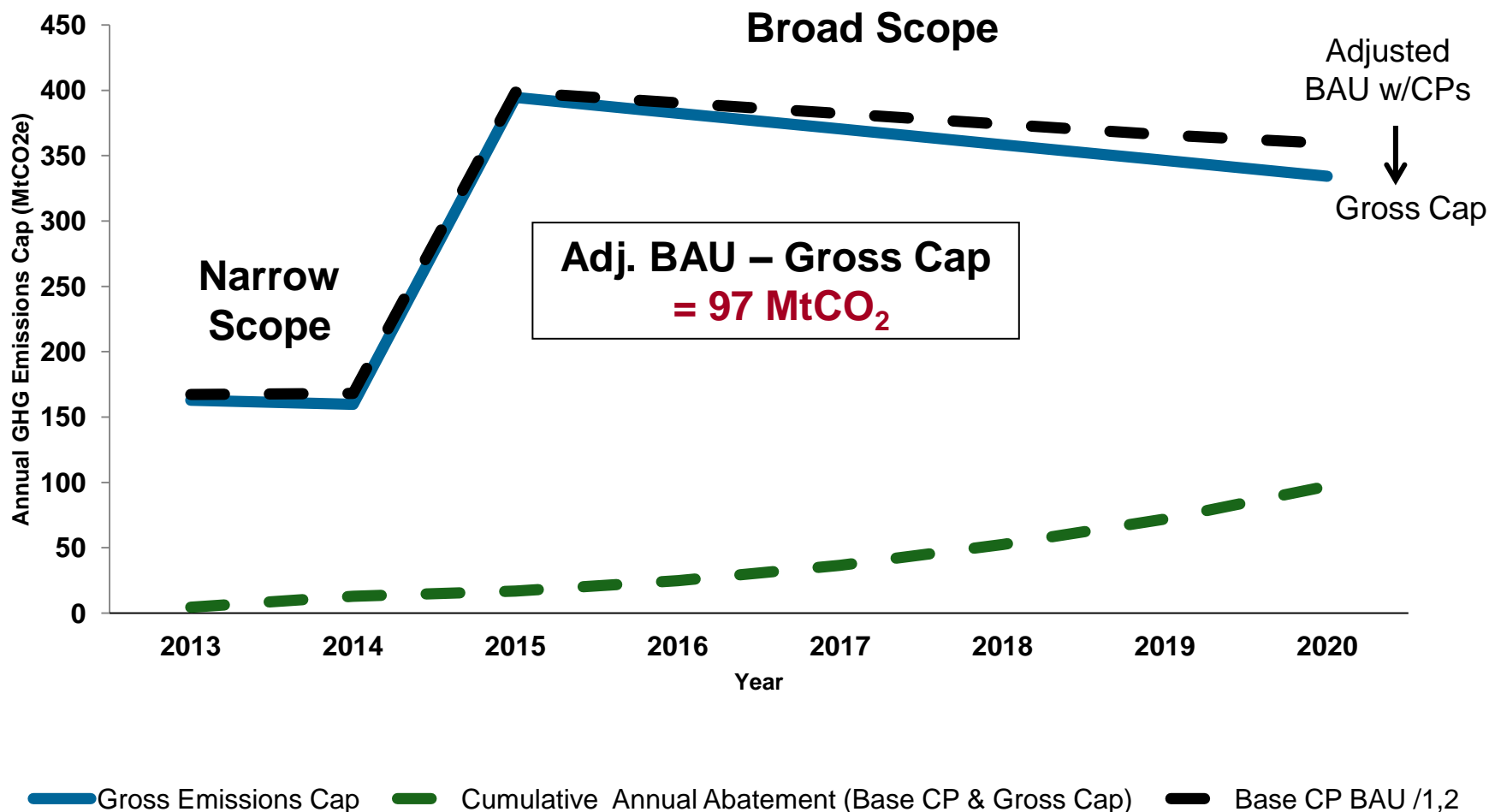


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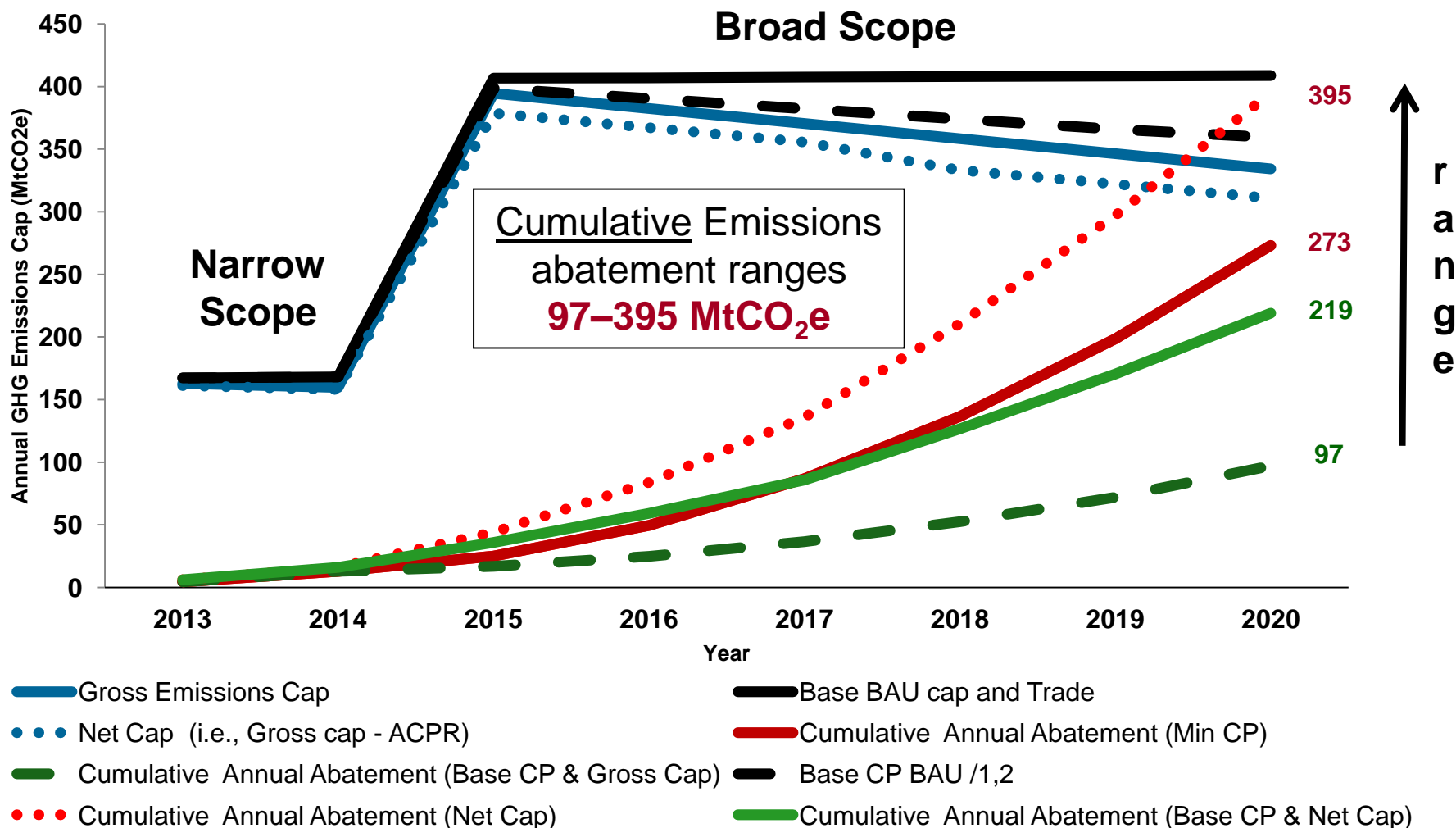


••• Net Cap (i.e., Gross cap - ACPR) — Base CP BAU /1,2 — Cumulative Annual Abatement (Base CP & Net Cap)

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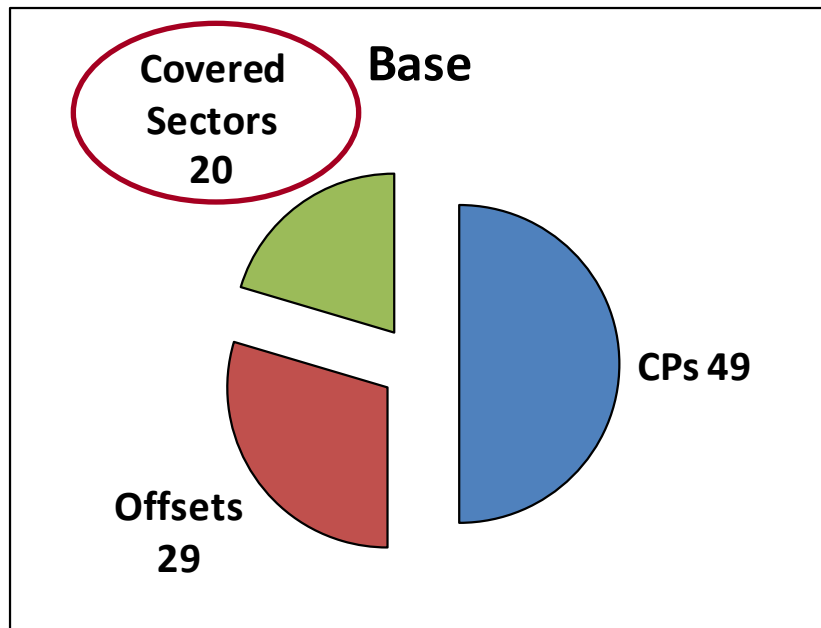


C&T Compliance Scenario

Base Case*

2020

Compliance gap = **98 Mt**
(Emissions-to-**Net Cap**)



- Assumes maximum allowed offsets (29 Mt) are available
- CPs achieve targets (49 Mt)
- CPs account for **50% of compliance**
- Covered sector abatement to address the **gap = 20 Mt**
- Actual emissions reductions from CPs is uncertain

* Assumes APCR is not used.

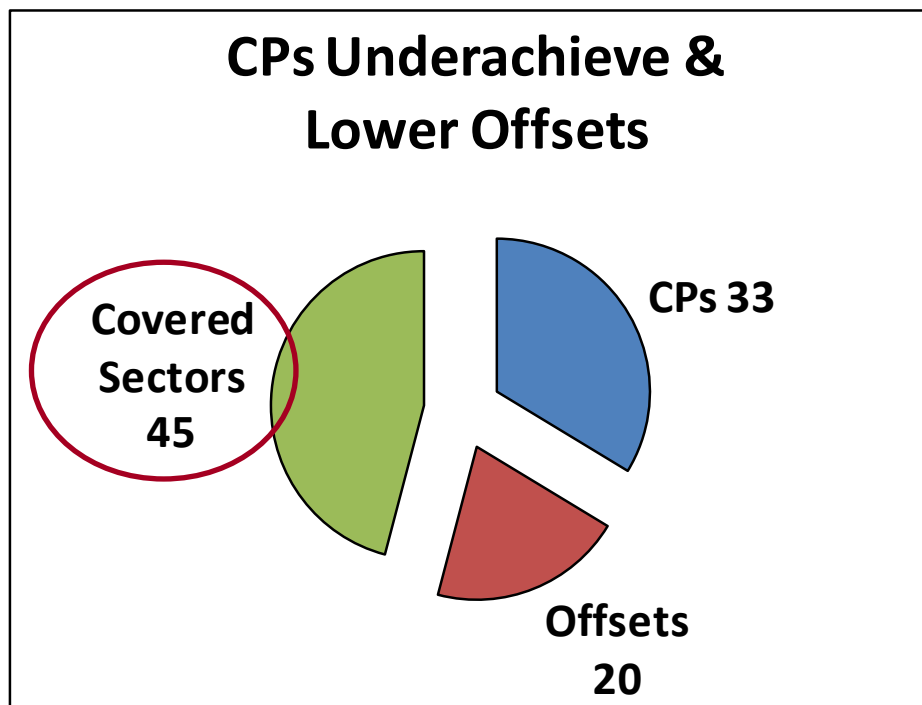
C&T Compliance

CPs Underachieve & Lower Offsets*

2020

Compliance gap = **98 Mt**
(Emissions-to-**Net Cap**)

CPs Underachieve & Lower Offsets



- Scenario assumes CPs deliver 33 Mt, and only 20 Mt of offsets are used
- Covered **sector abatement must increase to 45 Mt.**
- Allowance prices may **increase**
- Dynamic may be reinforced if offset supply or hydro / nuclear generation is lower than estimated, or if economic growth is higher than expected.

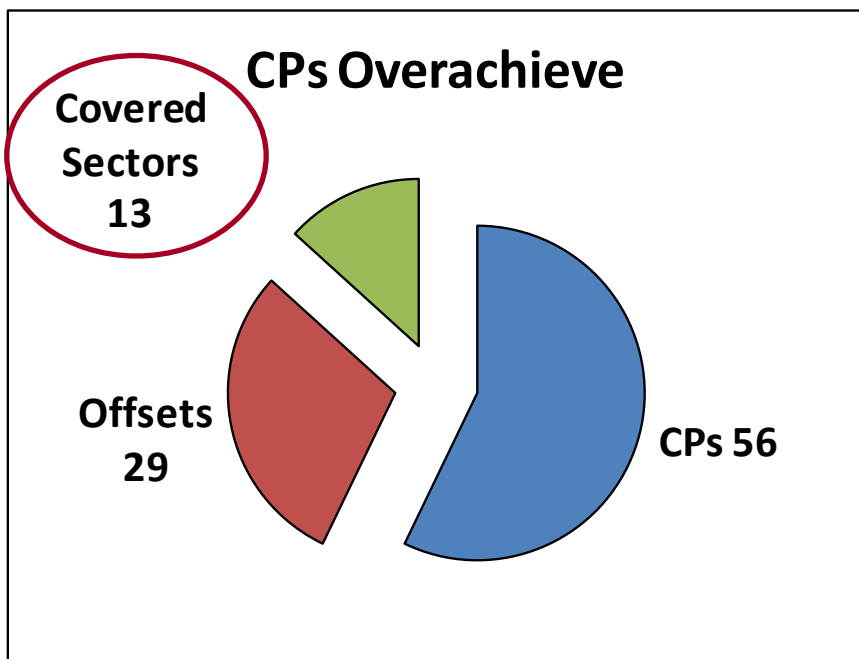
* Scenario 1b assumes APCR is not used.

C&T Compliance 2020

CPs Overachieve*

2020

Compliance gap = **98 Mt**
(Emissions-to-**Net Cap**)



- Scenario assumes CPs achieve 15% more reductions than in base case (56 Mt).
- Covered sector abatement will **decrease to 13 Mt.**
- **Allowance prices may decrease** (but, total social costs may increase)
- Dynamic may be reinforced if offset supply, or hydro / nuclear generation is higher, or if economic growth is lower than expected

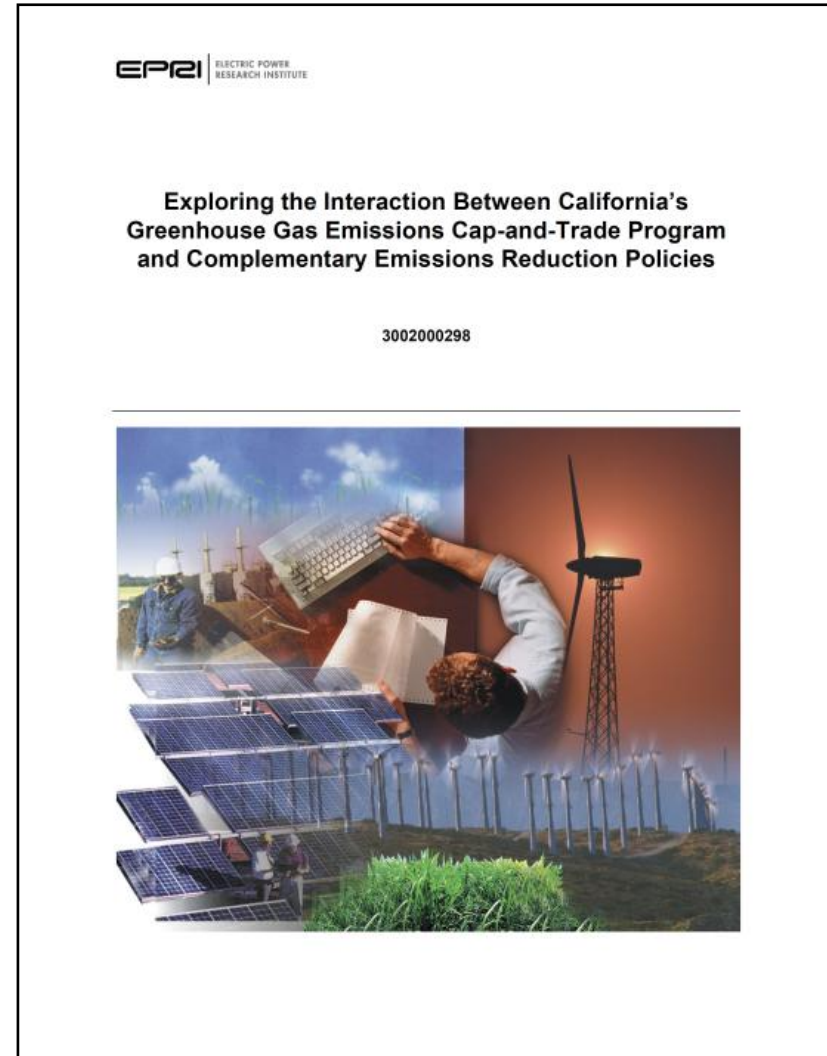
* Scenario 2A assumes allowance reserve is not used.

Key Insights

- California's "hybrid" climate policy approach is not unique. The EU, Quebec and Australia also have combined CP's with C&T, and past U.S. climate legislation (e.g., Waxman-Markey – HR 2454) also included complementary policies and a C&T program.
- Most emissions reductions in CA are expected to come from direct measures. The C&T program is supplemental, and is designed to provide a "backstop" that guarantees reductions will be achieved.
- Expected C&T GHG emissions abatement is highly uncertain, and depends on: (i) APCR; (ii) offset usage, (iii) success of complementary policies; and, (iv) other factors (e.g., economic growth).
- The success of CP's in reducing GHG emissions will impact the amount of abatement required to achieve the cap and allowances prices.
- CP's may increase net social cost of achieving AB-32 goals, as compared to a "pure" cap-and-trade program, but are likely to lead to lower "visible" CO₂ allowances prices in the market.

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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Thank You

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