



Mandatory GHG Reporting and Cap-and-Trade Program Workshop

Energy Imbalance Market (EIM)

October 21, 2016

Accounting for Electricity Emissions Under AB 32

- AB 32: “Statewide GHG emissions” includes all GHG emissions from the generation of electricity delivered to and consumed in California, accounting for transmission and distribution lines losses, whether that electricity is generated in state or imported
 - California power plants must report facility level emissions under MRR
 - Electricity importers must report imports based on physical delivery of electricity by source
 - Imported electricity reported as either specified or unspecified

Specified vs. Unspecified Imports

■ Specified Source Imports

- Importer must own, operate, or contract for the power
- Must be directly delivered to California from the source
- Power must be specified when parties agree to deal
- Unspecified power cannot be resold as specified power
- Report the lesser of power generated or scheduled (with certain exceptions)

■ Unspecified Imports

- Generation source not specified when parties agree to deal
- Power that does not meet specified source requirements
- Unspecified emission factor captures emissions impact from “marginal” source in western power markets

- EIM imports currently being reported as specified power from participating resources identified by CAISO’s model

California Climate Policies (1 of 2)

- Ensure accurate accounting of full GHG burden on the atmosphere as a consequence of electricity generated and consumed in California
 - Needed to track progress towards the AB 32 goals, including 2020 target, and assess compliance obligations in the Cap-and-Trade Program
- Ensure implementation and design of policies supporting California GHG goals

California Climate Policies (2 of 2)

- EIM optimization leads to inaccurate GHG accounting for electricity consumed in CA in some cases
- CAISO has discussed this issue in terms of emissions associated with a “primary” and “secondary” dispatch
 - Primary dispatch is referred to in MRR as electricity designated by CAISO’s EIM optimization model as electricity imported to serve California load (see “imported electricity” definition)
 - Secondary dispatch illustrates the potential backfill effect of higher emitting resources to serve EIM load when the optimization attributes lower emitting resources to serve California load
 - Secondary dispatch not defined in EIM tariff, secondary dispatch not observable by market participants (CAISO Market Results Interface)

ARB Options Under Consideration for Addressing EIM Accounting

- ▣ Incremental above-economic-base deeming¹
- ▣ Modified optimization with dynamic hurdle rate and renewable contracts for external resources²
- ▣ Other options, or variations of options, discussed by CAISO at their October 13, 2016 workshop (excluding crediting of exported electricity)
- ▣ Open to stakeholder proposals

¹ Option 2 presented at CAISO's October 13, 2016 workshop

² Modification to Option 3 presented at CAISO's October 13, 2016 workshop

Incremental Deeming Option

- CAISO optimizes energy bids in the absence of California load and generation then optimizes EIM for actual dispatch instructions
- Deemed generation to serve California load would come from the incremental difference between these two schedules
- Needs to ensure option addresses emissions accounting concerns
- CAISO indicates full optimization not computationally possible at this time

Dynamic Hurdle Rate Option (1 of 2)

- Optimization assigns imports as deemed delivered to California at the 5-minute average emissions rate of the external grid
 - Cost of compliance would be included in the optimization
 - EIM imports not assigned to specific resources
 - Seeking stakeholder input on alternative calculations of hurdle rate
- Renewable contracts entered into by California load serving entities (LSE) would be assigned a zero compliance obligation
- EIM imports with compliance obligation:
 - $\text{EIM Imports} = \text{CA Load} - \text{CA Supply} - \text{CA LSE renewable contracts}$
- Question: Who would be assigned the compliance obligation?

Dynamic Hurdle Rate Option (2 of 2)

- Emissions accounting of energy imports at average system rate
- Maintains recognition for renewable contracts by applying zero emission factor
- Secondary dispatch not relevant: energy imports assigned uniform interval-specific emissions rate
- Could extend to regional market and multiple carbon pricing regimes¹
- CAISO variation of this option retains resource specific attribution through deeming generation and applying a hurdle rate for remaining emissions

¹ Multiple carbon markets may require future modification

Next Steps

- Staff will continue to work with stakeholders and CAISO to identify options and discuss implementation details
 - Please provide feedback after workshop on these options or additional options not presented today (through 5pm on November 5, 2016)
- Staff will propose a solution as part of the 15-day regulatory amendments for both MRR and Cap-and-Trade

Additional Information

- Mandatory Greenhouse Gas Reporting Program:
<http://www.arb.ca.gov/cc/reporting/ghg-rep/ghg-rep.htm>
- Cap-and-Trade Program:
<http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm>
- Email questions and comments to:
byronsher@calepa.ca.gov



AB 197 & Post-2020 Cap-and-Trade Program Design

October 21, 2016

Review of Program Design

- ▣ AB 197
 - ▣ Prioritize measures resulting in direct reductions while considering the social costs of carbon and following AB 32 requirements such as considering cost-effectiveness and minimizing leakage
 - ▣ Does not prohibit a cap-and-trade program
- ▣ September 2016 Board Hearing
 - ▣ Equity and Cap-and-Trade Paper
 - ▣ Board member questions regarding potential adverse impacts to local air quality
 - ▣ Questions regarding program effectiveness for direct reductions
- ▣ EJAC recommendations
 - ▣ Prescriptive regulations in lieu of post-2020 Cap-and-Trade Program

Potential Design Changes

- Consider which Program features could be refined to support greater emissions reductions at covered entities
- Potential changes must be coordinated with our linked partners
- Potential changes will be evaluated for impact to compliance cost for covered entities

Role of Offset Credits

- An offset credit represents a real, quantifiable, enforceable, verifiable, additional, and permanent GHG reduction
- Offset credits provide reductions outside of covered sectors
- Offset credits are a compliance cost management feature
- Current offset credit usage limit is 8%
- Staff considering lowering the offset usage limit post-2020
 - This change would be subject to cost-containment/economic analysis

Industrial Allowance Allocation

- ▣ Currently, allowance allocation to industrial covered entities is for leakage prevention and transition assistance
- ▣ Allocation is calculated based on production or historic energy use
- ▣ Allocation methodology could shift to a cost-burden approach
 - ▣ Allocation would be reduced annually to reflect reduced compliance obligation owing to expected onsite emissions reductions
 - ▣ This shift in methodology would be consistent with the EAAC recommendation to move to more auctioning and less free allocation

Treatment of Unsold Allowances

- ▣ ARB could retire some or all unsold State-owned allowances with vintage year 2020 or earlier
 - ▣ The Program already includes a self-regulating mechanism for periods when allowance demand is low
 - ▣ This adjustment could be done to recognize that emissions are currently declining faster than anticipated
 - ▣ This change would be subject to cost-containment evaluation
 - ▣ Must be coordinated with linked partner(s)

Market Data Transparency

Market Information Currently Collected by ARB

- ARB collects market sensitive and confidential business information (CBI) through
 - CITSS User Registration (know-your-customer data)
 - Registration (employees, owners, corporate associations)
 - Allocation (output data)
 - Trading (prices, trading partner identities, other contract terms)
 - CITSS account balances (compliance instruments held)
- Certain market sensitive information and CBI may be exempt from disclosure under the California Public Records Act (PRA) and protected by applicable privacy laws
- ARB prevents asymmetric release of market sensitive data to avoid conferring market advantage

Release of Information Collected By Cap-and-Trade Program (1 of 2)

- Current regulation treats some information as confidential
 - Information collected directly from individuals (e.g., CITSS users)
 - Entity registration information involving individuals
 - Identity of counterparties to a CITSS transfer
 - Account balances of identifiable individual CITSS accounts
 - Allocations, which are based on CBI output data

Release of Information Collected By Cap-and-Trade Program (1 of 2)

- Current regulation allows publication of other data
 - Prices and quantities of individual transfers with identities of parties masked
 - Aggregated or otherwise non-identifiable CITSS account holdings
 - Retirements by quantity, vintage and instrument type (aggregated and entity-specific)
 - Data may be released as part of market investigation and enforcement (including sharing with Federal agencies)
- Proposed regulatory amendments do not alter potential releases

Market Data Available Online

- Quarterly CITSS Registrant Reports list all registered entities and corresponding reporting facility IDs
- Quarterly Auction Summary Results Reports includes auction settlement price, quantities sold, and bid metrics
- Annual Compliance Reports include retirements by entity, instrument type, and vintage
- Annual summary of transfers reports contain total transfers, quantity and average price by instrument type (beginning with 2014 data)
- Quarterly Compliance Instrument Report contains aggregated account data by vintage and account type
- Data related to Cap-and-Trade
 - GHG Emissions Reporting (annual by reporting entities)
 - Proceeds and California Climate Investments
- Overview: https://www.arb.ca.gov/cc/capandtrade/public_info.pdf

Additional Market Data Publication Under Consideration

- ▣ ARB publishes transfer quantities and average prices annually. Considering if possible to publish more frequently
- ▣ Emissions Market Advisory Committee (EMAC) suggested:
 - ▣ Market needs more information on availability of instruments vs. obligations
 - ▣ Metric: entity positions (entity-level holdings vs. obligations, mask identities)
 - ▣ Format: bar graph ranging from entities with longest to shortest position based on estimated obligations
 - ▣ https://www.arb.ca.gov/cc/capandtrade/emissionsmarketassessment/information_release_2014feb_rev.pdf
- ▣ Staff continues to discuss with partner jurisdictions and to assess when this type of information could be ready for release

What additional information should be made public?

- ▣ ARB staff is soliciting ideas on what additional information could be made public
- ▣ Request stakeholders submit ideas, including a rationale for why such data is important to release, when submitting comments on this workshop
- ▣ As mentioned previously, staff will continue to discuss with partner jurisdictions to assess other types of information release

Questions and Comments



Post-2020 Allowance Allocation

October 21, 2016

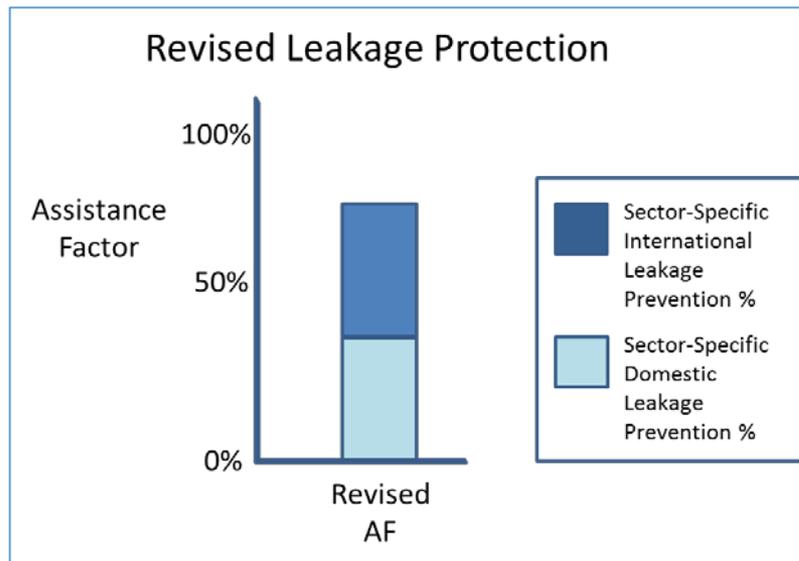
Industrial Allocation: 2013–2020

Assistance Factors

- Direct allocation is provided to minimize emissions leakage and to provide transition assistance in the first and second compliance periods of the program (2013–2017)
 - All sectors receive 100% assistance factor (i.e., 100% x benchmark x cap adjustment factor x output or historical fuel use)
- In the third compliance period (2018–2020), assistance factors will decrease for sectors at medium (75 percent) and low (50 percent) risk of leakage
 - Each covered sector's risk of leakage was determined through analysis of emissions intensity and trade exposure

Staff Proposal for Post-2020 Assistance Factors

- Staff proposes to utilize leakage studies completed in 2016 to calculate assistance factors for the post-2020 period
- Post-2020 assistance factors would be calculated as the sum of two components targeted to minimize international leakage risk and domestic leakage risk:



International Leakage Prevention: Studied Sectors (1 of 2)

- Staff proposes to calculate international leakage risk using international market transfer (IMT) from the UC Berkeley leakage study
- IMT = percent of every dollar decrease in domestic value added that is offset by an increase in international production in response to a GHG compliance cost

International Leakage Prevention: Studied Sectors (2 of 2)

- Industry-specific IMT would be calculated as the simple average of raw IMT (i.e., IMT directly from the UC Berkeley study) and a regression IMT
- The regression IMT uses linear regression of a sector's raw IMT relative to trade exposure and energy cost intensity to obtain coefficients:
 - This smoothing was recommended by the UC Berkeley researchers
 - $\text{Regression IMT} = (\text{trade exposure coefficient} * \text{industry trade exposure}) + (\text{energy cost intensity coefficient} * \text{industry energy cost intensity})$
 - Sectors with high trade exposure would receive high regression IMT
 - Approach is described on pages 4 and 5 of the informal staff proposal
(<https://www.arb.ca.gov/cc/capandtrade/meetings/20161021/ct-af-proposal-101416.pdf>)

Domestic Leakage Prevention: Studied Sectors (1 of 3)

- Staff proposes to calculate domestic leakage risk using domestic drop from the Resources for the Future (RFF) leakage study
 - Domestic drop is the estimate of decreases in output or value added due to domestic competition based on a GHG compliance cost
- Staff used four domestic drop values, two from the RFF study and two values calculated as regressions of those values:
 - Value added domestic drop
 - Output domestic drop
 - Regressed value added domestic drop
 - Regressed output domestic drop
- Regressed values smooth RFF estimates based on energy cost intensity

Domestic Leakage Prevention: Studied Sectors (2 of 3)

- For the domestic component of the assistance factor, staff proposes to use the average of the assistance factor for each domestic drop that prevents a 7 percent drop in (regressed or non-regressed) output or value added at the 2022 auction reserve price. For example, for value-added domestic drop for sector X:
 - 20 percent assistance factor → 7.2% value-added domestic drop
 - 30 percent assistance factor → 6.5% value-added domestic drop
 - Therefore, sector X receives 30 percent assistance factor for the value-added domestic drop methodology
- Proposed domestic assistance factor component = average of four assistance factors determined by application of each domestic drop

Domestic Leakage Prevention: Studied Sectors (3 of 3)

- Some studied sectors have emissions not considered by the domestic (Resources for the Future) leakage study
- Table 2 of the informal staff proposal lists the fraction of emissions from fuels considered by the domestic study versus:
 - Process emissions;
 - Non-purchased fuel emissions (e.g., refinery fuel gas); and
 - Coal and coke use (e.g., cement industry)
- Regression domestic drop estimates regress industry domestic drops (value added or output) on logged energy intensity
 - For sectors listed in table 2, energy intensity is adjusted upwards as follows:

$$\text{regression energy intensity} = \text{domestic study energy intensity} / (\text{table 2 purchased fuels fraction})$$

Non-Studied Sectors

- Post-2020 assistance factors for non-studied sectors are shown as “TBD”
- Staff’s initial plan was to match non-studied sectors to IMT and domestic drop of overall manufacturing sector using:
 - Energy cost intensity data from U.S. Economic Census
 - Trade exposure data from U.S. Census and USA Trade Online
- This approach is similar to regressed IMT and regressed domestic drop approaches for manufacturing (also adjusted for process emissions)
- However, staff discovered mismatches in data between the U.S. Census and USA Trade Online data
 - Staff is following up with U.S. Census staff to check data quality for all non-studied sectors
 - Staff requests suggestions for other applicable data sources for these sectors

Concluding Thoughts

- Staff aiming for transparency in informal staff proposal and accompanying international study dataset¹ release
- Today's workshop continues the conversation begun in the 45-day rulemaking package on post-2020 industrial allocation:
 - Workshop comment period (through 5 pm on November 5, 2016)
 - Staff especially requests suggestions on data sources to use to apply the proposed assistance factor calculation methodology to non-studied sectors
 - Official 15-day comment period

¹ <https://www.arb.ca.gov/cc/capandtrade/meetings/20161021/ucb-leakage-study-data.xlsx>

Post-2020 Allowance Allocation to Electrical Distribution Utilities (EDUs)

2021-2030 Allocation to Electrical Distribution Utilities

- In response to stakeholder comments, staff is considering a refinement to the previously proposed post-2020 electrical distribution utility (EDU) allocation methodology, and presented two options, both based on cost burden
 - Cost burden is the anticipated incremental cost of power to serve load due to the requirement to surrender compliance instruments in the Cap-and-Trade Program
- The allocation calculation methodology is similar to the methodology used for 2013-2020 allocation to EDUs
- Also in response to stakeholder comments, staff is reconsidering the previous proposal to remove the RPS adjustment post-2020

2021-2030 EDU Allocation Methodology Proposal (1 of 2)

- Calculate Program cost burden for each year (2021–2030)
 - Data sources are CEC’s 2015 demand forecast and EDUs’ 2015 S-2 resource plans (where available)
 - Cost burden would be based on emissions from natural gas (0.4354 MTCO₂e/MWh) and solid fuel resources (generator-specific emission factor)
 - Natural gas generation = (total generation for load) – (coal generation) – (zero-emission generation)
 - Each EDU is assumed to meet mandated RPS requirements (33 percent of load in 2020 to 50 percent of load in 2030)
 - Load served by natural gas is assumed to never drop below 5 percent to account for support for variable renewable resources
- Reduce allocation each year with the cap

2021-2030 EDU Allocation Methodology Proposal (2 of 2)

- For EDUs with industrial covered entity customers, calculated cost burden is reduced to account for emissions associated with industrial covered entities' purchased electricity
 - Each EDU's industrial covered entity emissions would be calculated as the product of baseline electricity consumption, each year's cap adjustment factor, and an EDU-specific emission factor for each year
 - Industrial covered entity information for each EDU (to the extent allowed by confidentiality) is shown in the last two columns of Table 1 of staff's informal EDU proposal:
<https://www.arb.ca.gov/cc/capandtrade/meetings/20161021/ct-edu-allocation-101416.pdf>

Options Under Consideration

- The only difference between the two options under consideration is the assumed load for each year
 - Option 1: EDUs' generation for load changes over time as estimated in the CEC demand forecast or S-2s
 - Option 2: Loads are fixed for 2021–2030 at the level estimated for 2020 in the demand forecast or S-2s

Differences from the 2013-2020 EDU Allocation Methodology

- No top-down component based on an electricity sector-wide allocation with a percentage of total to each EDU
- No energy efficiency/early action credit because early action has already been recognized and energy efficiency/RPS requirements are now essentially the same for all EDUs
- No assumption that power from renewable qualifying facilities is priced at market
 - Projected amount of power from renewable QFs: 101 GWh in 2024 (down from 3,121 GWh in 2013; source: 2015 S-2s)
- Calculated cost burden for EDUs with industrial covered entities would be reduced to account for emissions associated with purchased electricity

RPS Adjustment

- Previous staff proposal from 45-day amendment package: eliminate the RPS adjustment after 2020 and provide EDUs with post-2020 allocation to compensate for investments in renewable electricity that is not directly delivered to California
- In response to stakeholder comments, staff now proposes to continue the RPS adjustment with the existing reporting and verification requirements, and to not provide any additional post-2020 allocation as a substitute
- Staff continues to work with reporters on how to claim an RPS adjustment in compliance with MRR

Electrification of Transportation

- Staff will continue to coordinate with energy agencies and stakeholders to assess the potential for allocating for emissions resulting from electrification of transportation

Additional Proposals Related to Allowance Allocation

Post-2020 Natural Gas Supplier Allocation

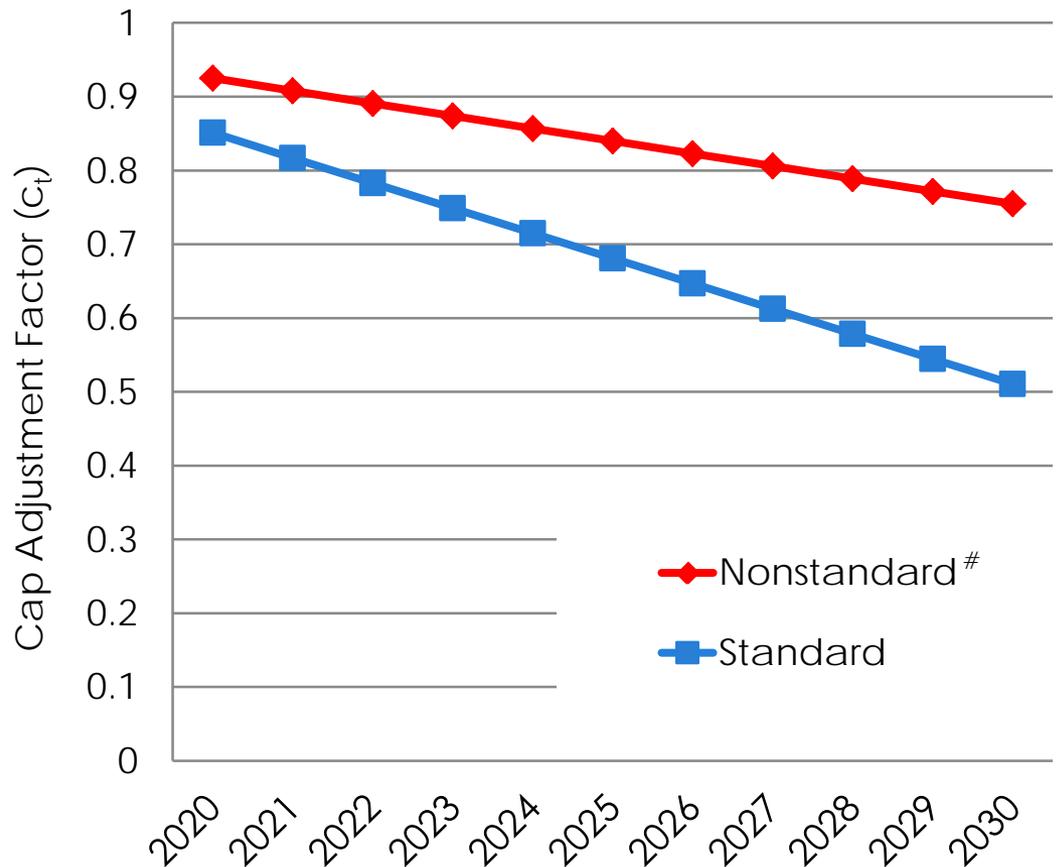
- As proposed in the Initial Statement of Reasons (ISOR) to the 45-day amendment package, staff still proposes that natural gas supplier allocation continue post-2020 based on the current calculation methodology
- Consistent with the proposal in the ISOR, staff proposes that natural gas suppliers consign 100 percent of allowances starting in 2021 (option 1 from March 29 workshop)
 - Increased consignment incentivizes increased GHG reductions
 - Full consignment aligns with EDU consignment requirement and creates equity between entities that are directly and indirectly covered by the Program

Other Post-2020 Allowance Allocation

- Staff still proposes that post-2020 allocation to universities and public service facilities, legacy contract generators with industrial counterparties, and public wholesale water agencies would continue under the current methodologies
- Allocations would adjust each year with the cap adjustment factor

Proposed 2021–2030 Cap Adjustment Factors

Year	C_t	
	Standard	Nonstandard [#]
2020	0.851	0.925
2021	0.817	0.908
2022	0.783	0.891
2023	0.749	0.874
2024	0.715	0.857
2025	0.681	0.840
2026	0.647	0.823
2027	0.613	0.806
2028	0.579	0.789
2029	0.545	0.772
2030	0.511	0.755



[#]Nonstandard sectors are those with greater than 50 percent process emissions and high leakage risk.

Waste-to-Energy Limited Exemption of Emissions

- The current Regulation includes a limited exemption of emissions for waste-to-energy facilities through 2015
- In this year's 45-day amendments to the Regulation, staff proposed extending this exemption through the second compliance period (i.e., through 2017)
- The Environmental Justice Advisory Committee has recommended that these facilities be subject to a compliance obligation
 - In response to this recommendation and discussion at September Board hearing, staff plans to revert to the existing language (i.e., with the limited exemption ending in 2015) in 15-day changes to the Regulation

Tentative Schedule

- ▣ Cap-and-Trade Regulation
 - ▣ November Annual Board update
 - ▣ Fall release of first 15-day changes
 - ▣ Early 2017 release of potential second 15-day changes
 - ▣ Spring 2017 final board hearing
 - ▣ Workshops– to be noticed

- ▣ Scoping Plan
 - ▣ November 7th– Policy scenarios workshop
 - ▣ November Board update on policy scenarios
 - ▣ Late November – Draft Scoping Plan release
 - ▣ January – First full draft with CEQA
 - ▣ March – Final draft
 - ▣ Workshops– to be noticed

Questions/Comments

- An informal comment period will run through Friday, November 4 at 5 pm:
 - https://www.arb.ca.gov/lispub/comm2/bcsubform.php?listname=ct-amendments-ws&comm_period=1
- Staff will consider comments when drafting the next (15-day) regulatory amendments for release this fall