



**EMBODIED CARBON IN
THE BUILT ENVIRONMENT:
SESSION 3 –
Policy Updates**

May 22, 2020



Research

- Data assessment
- Data methodology
- Policy
- Strategies



Resources

- Newsletters
- Toolkits
- Curricula
- References



Network

- Local hubs
- Focus groups
- Online community
- NGO roundtable
- Members



Initiatives

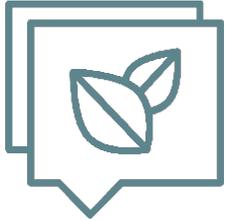
- SE 2050 Challenge
- EC3 Tool
- Events
- Etc.



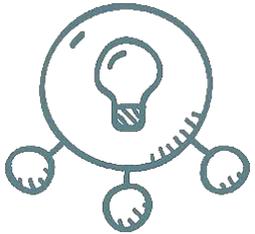
Sponsors

- Organizations
- Foundations
- Individuals

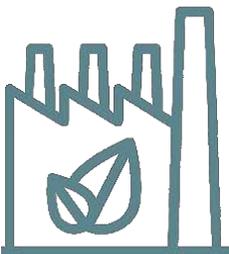
Network Overview



Communication and knowledge building platform

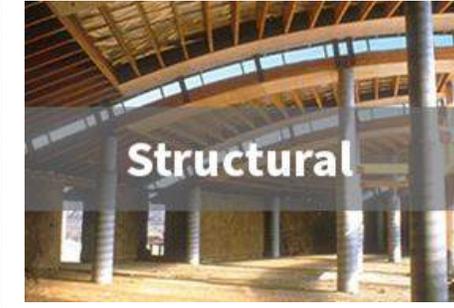


~2,000 members from industry, nonprofits, governments, academia



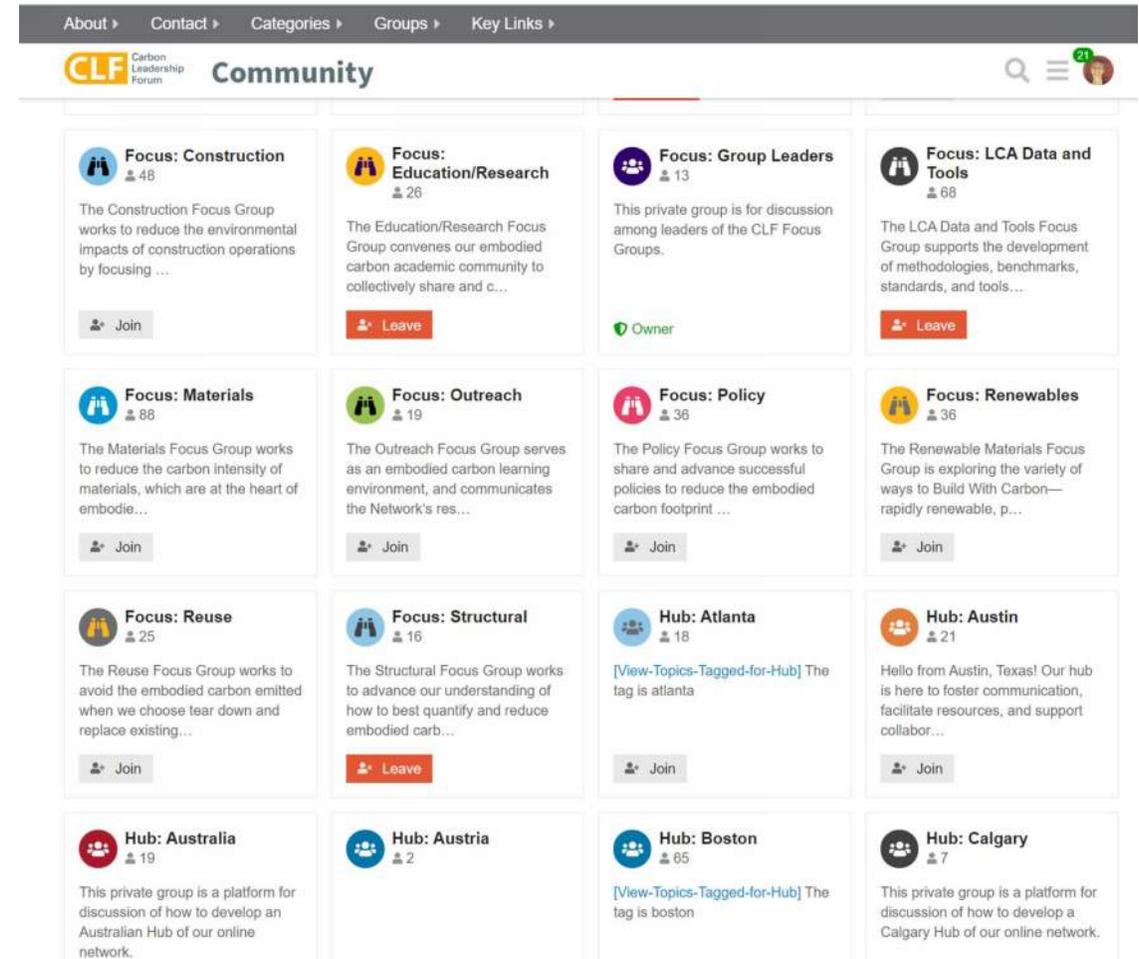
Common mission to accelerating the transformation of the building sector to radically decarbonize buildings and building materials through collective action

Network Focus Groups: 10 Focus Groups



Growing a Global Movement <https://community.carbonleadershipforum.org/>

- 1,200 Community Users
- 10 Focus Groups
- 12 Regional Hubs
 - Atlanta
 - Austin
 - Boston
 - Chicago
 - Los Angeles
 - New York City
 - Portland
 - Rocky Mountain
 - San Francisco
 - Seattle
 - Vancouver
 - Yellowstone



www.carbonleadershipforum.org



The American Institute of Architects

MITHŪN



Carbon Innovations



ARUP



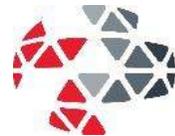
Interface®

KIERAN TIMBERLAKE



SKANSKA

Thornton Tomasetti



walter p moore



CALLISON RTKL



LeMessurier



SIMPSON GUMPERTZ & HEGER



tk1sc

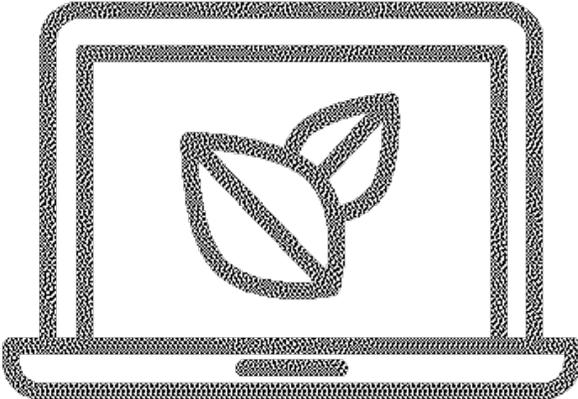


ADRIAN SMITH + GORDON GILL | AIA SEATTLE | AMBIENT ENERGY | ARKIN TILT | BRIGHTWORKS | CLIMATE EARTH | COUGHLIN PORTER LUNDEEN | KATERRA | LMN ARCHITECTS | LUND OPSAHL | NATIONAL READY MIXED CONCRETE CO | NRMCA | SHKS | SIEGEL & STRAIN ARCHITECTS | WRNS STUDIO

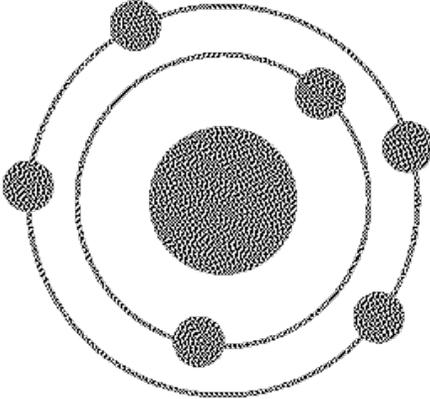


Series Overview

Research, case studies, strategies to measure and reduce embodied carbon



Six online sessions



Subject matter experts



AIA CE Credits

Disclaimer

Webinar Series Disclaimer

This session is provided as part of the Carbon Leadership Forum's Network 2019 Webinar Series. We invite guest speakers to share their knowledge and insight on topics related to carbon emissions attributed to building materials. The series aims to introduce topics that lead participants to think and talk about building industry strategies for reducing carbon emissions.

Mention of trade names or commercial products does not constitute endorsement or recommendation for use. Please note the opinions, ideas, or data presented by speakers in this series do not represent members of the Embodied Carbon Network or constitute endorsement by the Network.

Logistics

- 15-20 minute Q&A session after presentations
- To receive AIA continuing education credit: send your AIA member number to info@carbonleadershipforum.org
- To access past webinar recordings, visit: <http://carbonleadershipforum.org/news-and-events/webinars/>

Save the Date!

ECN Quarterly Call – July 17, 2020

Webinar #4 Structures – Aug 21, 2020

Policy co-chairs



Ryan Zizzo
Founder & Chief Operating
Officer at Mantle



Jordan Palmeri
Senior Policy Analyst in the
Materials Management Program
at the Oregon Department of
Environmental Quality

Webinar Overview



Natasha Balwit
Architecture 2030's Research
and Communications
Coordinator



Patrick Enright
Green Building Engineer
with the City of Vancouver's
Sustainability Group

Webinar Overview



Jose "JB" Tengco
Western States Director for
the BlueGreen Alliance



Michael O'Connor
Science & Technology Policy
Fellow in Congressman Paul
Tonko's office (D-NY)

Embodied Carbon Policy Framework

CITY POLICY FRAMEWORK FOR

Dramatically Reducing Embodied Carbon

COMING SOON

Regulations • Codes • Incentives • Programs

Embodied Carbon Policy Framework

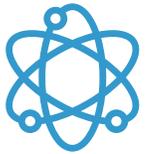
Embodied Carbon Reduction Mechanisms



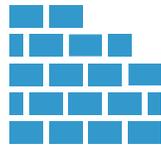
Material Switching



Construction Emissions Reduction



Innovation



Material Use and/or GWP Reduction



Waste Reduction



Transportation Emissions Reduction

Policy Card Contents

Scoring

- Carbon impact
- Cost-efficiency
- Ease of implementation
- Enforceability

Summary

Benefits

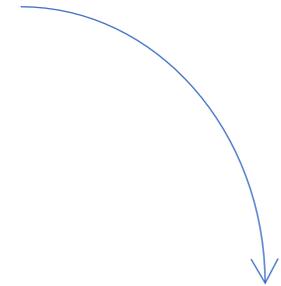
Prerequisites

Variants

Enforcement

Examples

Template Policy Language



Example: Low Carbon Cement or Concrete Policy

Low carbon cement and concrete requirement

IMPLEMENT AS:
Building or Infrastructure Regulation, Procurement Requirement

CARBON IMPACT ●●●●○
COST EFFICIENCY ●●●○○
EASE OF IMPLEMENTATION ●●●○○
ENFORCEABILITY ●●●○○

REDUCTION MECHANISMS



SUMMARY

Implement a comprehensive low carbon cement and concrete policy that shall

- Remove water to cement ratios and other prescriptive ratios for concrete that create a non-performance-based requirement to use more cement
- Set maximum carbon performance limits for concretes by strength classes
- Encourage applying strength evaluation time at 90d not 28d to enable broader use of secondary binders (e.g. fly ash or blast furnace slag)

BENEFITS

Cement and concrete are essential construction materials that are used in very significant quantities. Due to cement manufacturing emissions and the sheer volume of use, they also have a high climate impact. Targeting cement and concrete with performance-based carbon requirements helps improve these products across the board in all construction which is subject to specified requirements.

PREREQUISITES

No pre-requisites for the construction that is purchased by the city, but requires regulatory powers for extending the scheme to the private sector construction. requires regulatory powers for extending the scheme to the private sector construction.

VARIANTS

Set maximum carbon performance limits for cements, alternative being to allow use of (in Europe) CEM II, III, IV, or V types except CEM II Portland-limestone cements.

ENFORCEMENT

Reduction in the amount of cement used in concrete manufacturing has potential to reduce cost, or at least remain cost neutral. Verification would need to be based on commercial documents for demonstrating origin, and on Environmental Product Declarations for demonstrating carbon performance of the purchased products.

SPOTLIGHT

Marin County Low Carbon Concrete Code

ADDITIONAL EXAMPLES:

Singapore Building and Construction Authority BCA Benchmark, Norwegian Concrete Association Carbon Concrete Standard, Masdar City local requirement, Dubai local requirement

LOCATION Marin County, California USA

IMPLEMENTATION DATE 2019

IMPLEMENTED AS Building Code

Marin County in California has implemented a Low Carbon Concrete Code, which provides a cement limit and an embodied carbon limit pathway. For each specified compressive strength, a maximum amount of ordinary Portland cement and a maximum embodied carbon are defined. Embodied carbon is shown by an Environmental Product Declaration in line with ISO 14025, and EN 15804 or ISO 21930.

Example: Density Bonus for Embodied Carbon Reduction

Density bonus for low embodied carbon

IMPLEMENT AS:
Building Regulation, Incentive



SUMMARY

Projects that meet the embodied carbon criteria are eligible for density bonuses in the form of additional units per acre or increased floor-area ratio.

BENEFITS

In many markets, added density is a significant financial benefit to developers. This incentive will result in more widespread and faster adoption of low-embodied carbon building practices. Density bonuses allow municipalities to offer a meaningful incentive with little or no financial investment, and without adding significant complexity to the permitting process.

PREREQUISITES

In order for density bonuses to be desirable for developers, current density limits must frequently be reached. As significant financial benefit is granted, the system should include the possibility of independent audit.

VARIANTS

If existing density bonus incentives exist for affordable housing or sustainable design, the embodied carbon criteria may be added as a pathway.

ENFORCEMENT

This policy would be enforced through existing zoning enforcement structures, so would not require additional resources or new systems for enforcement.

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Example: Zoning for Low-Carbon Building Typologies

Zoning for low embodied carbon building typologies

IMPLEMENT AS:
Zoning and Land Use

CARBON IMPACT ● ● ● ○ ○
COST EFFICIENCY ● ● ● ● ●
EASE OF IMPLEMENTATION ● ● ● ● ○
ENFORCEABILITY ● ● ● ● ●

REDUCTION MECHANISMS



SUMMARY
Building typology and massing influence embodied carbon: for example, extremely tall buildings require greater quantities of structural materials that are generally high in embodied carbon, and buildings with inefficient massing also require greater quantities of material. Through zoning regulations, a jurisdiction with zoning authority can require building heights to be within an identified carbon-optimal range, and enforce prescriptive requirements for building typology and massing, similar to the ways zoning laws are used to set requirements for building setbacks, heights, use, and typology.

BENEFITS
Zoning allows jurisdictions to enforce prescriptive requirements over large sections of the city, affecting a significant portion of new construction.

PREREQUISITES
The jurisdiction must have authority to set and enforce zoning regulations.

VARIANTS
No variants have been identified for this policy.

ENFORCEMENT
This policy would be enforced through existing zoning enforcement structures, so would not require additional resources or new systems for enforcement.

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Embodied Carbon Policy Framework

Low carbon cement and concrete requirement

CARBON IMPACT ●●●●○

COST EFFICIENCY ●●●○

EASE OF IMPLEMENTATION ●●●○

ENFORCEABILITY ●●●○

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Density bonus for low embodied carbon

CARBON IMPACT ●●●●○

COST EFFICIENCY ●●●●

EASE OF IMPLEMENTATION ●●●○

ENFORCEABILITY ●●●○

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Building Regulation, Incentive

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Zoning for low embodied carbon building typologies

CARBON IMPACT ●●●○

COST EFFICIENCY ●●●●

EASE OF IMPLEMENTATION ●●●○

ENFORCEABILITY ●●●●

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Embodied Carbon Policy Framework

CITY POLICY FRAMEWORK FOR

Dramatically Reducing Embodied Carbon

COMING SOON

embodiedcarbonpolicies.com





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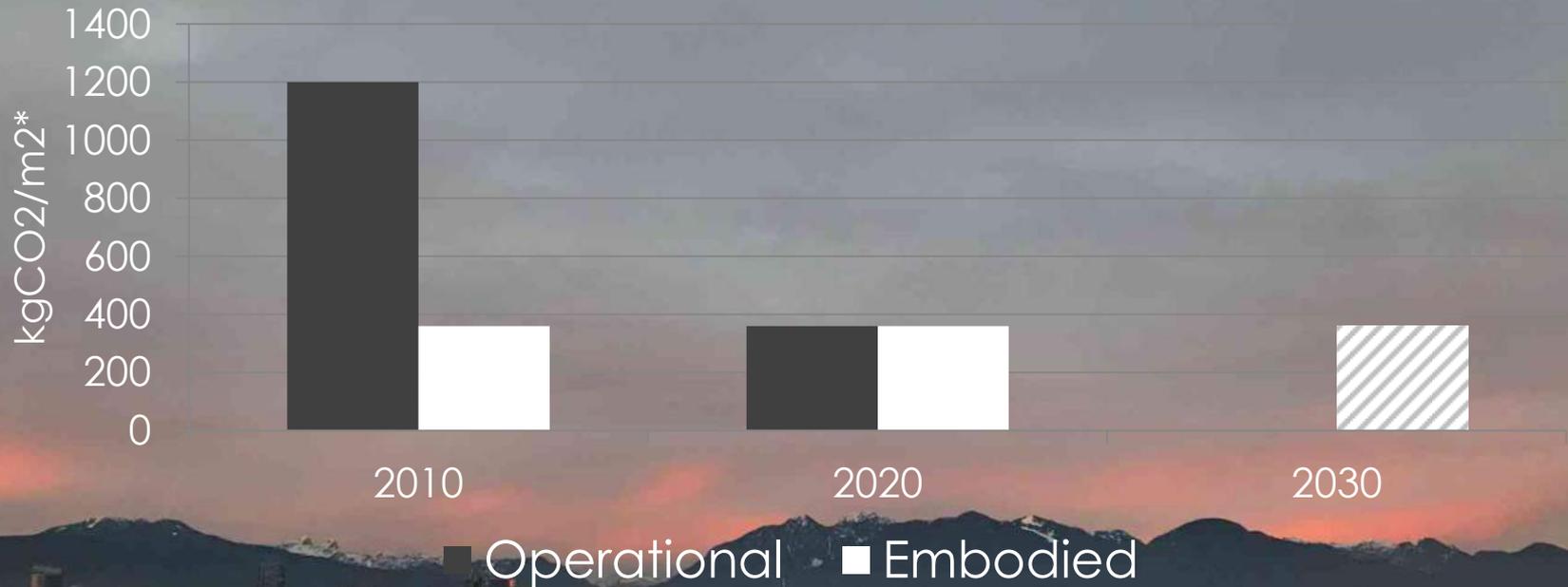
MATERIALS MATTER

TAKING CARBON OUT OF CONSTRUCTION



PATRICK ENRIGHT
CITY OF VANCOUVER

WHAT ARE WE ALREADY DOING?



*assuming a 60yr lifespan

CLIMATE EMERGENCY RESPONSE

6 BIG MOVES



WALKABLE
CONNECTED
COMMUNITIES



SAFE AND CONVENIENT
ACTIVE TRANSPORTATION +
TRANSIT



POLLUTION-FREE
CARS, TRUCKS
+ BUSES



ZERO EMISSIONS
SPACE AND
WATER HEATING



LOWER CARBON
CONSTRUCTION MATERIALS
+DESIGNS



RESTORED FORESTS +
COASTS

BIG MOVE

5



LOWER CARBON CONSTRUCTION MATERIALS AND DESIGNS

By 2030, the embodied emissions in new buildings and construction projects will be reduced by 40% compared to a 2018 baseline.

CURRENT WORK:

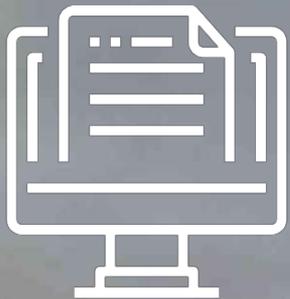
- ENABLE TALLER MASS TIMBER IN CODE ✓
- STUDY - COSTS AND BARRIERS
- STAKEHOLDER CONSULTATION
- DRAFT - EMBODIED CARBON STRATEGY
 - SET REDUCTION TARGET FOR 2021

DRAFT - EMBODIED CARBON STRATEGY:

- 1) LOW CARBON BUILDING REQUIREMENTS
- 2) REMOVE BARRIERS AND PROVIDE CATALYSTS
- 3) SUPPORT LOW CARBON NETWORKS
- 4) LOW CARBON PLANNING AND STRATEGIES

WHAT YOU CAN DO:

- 1) ENGAGE WITH LOW CARBON NETWORKS
- 2) LOOK HARD AT YOUR OWN PROJECTS
- 3) ADVOCATE WITH CLIENTS, GOVERNMENT, & PEERS
- 4) SHARE YOUR DATA & LESSONS LEARNED (EVEN MISTAKES!)



Stay informed!

[vancouver.ca/
climateemergency](https://vancouver.ca/climateemergency)



Let's talk!

[green.buildings
@vancouver.ca](https://green.buildings@vancouver.ca)

Buy Clean: A Winning Coalition



Jose "JB" Tengco
Western States Director
BlueGreen Alliance





BLUEGREEN ALLIANCE



Buy Clean California (AB 262)

The **Buy Clean California Act** states the Department of General Services is required to establish and publish the maximum acceptable Global Warming Potential (GWP) for certain materials.

Materials must have a GWP that **does not exceed** the limit set by DGS.

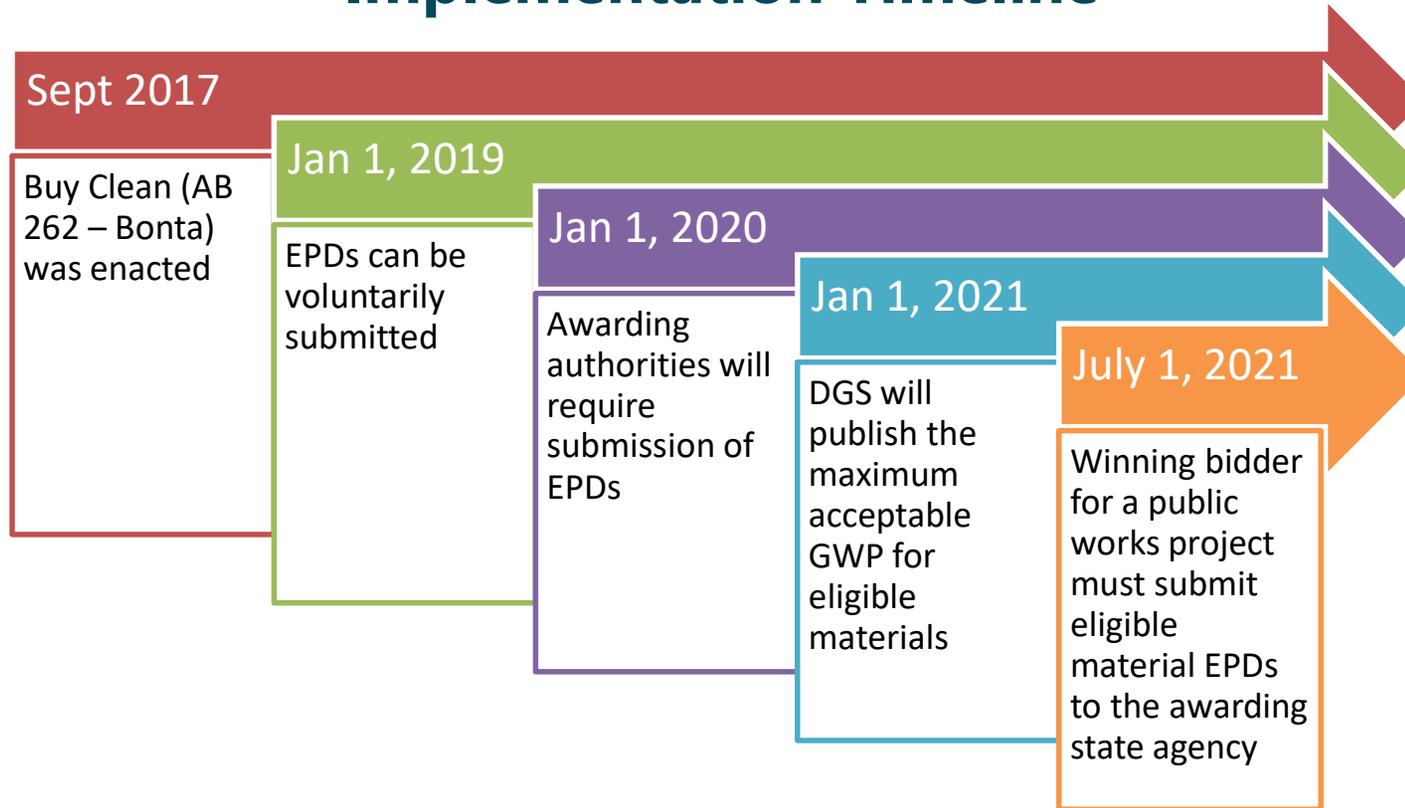
Materials include:

- structural steel (hot-rolled sections, hollow structural sections, and plate)
- concrete reinforcing steel
- flat glass
- mineral wool board insulation



Buy Clean California

Implementation Timeline

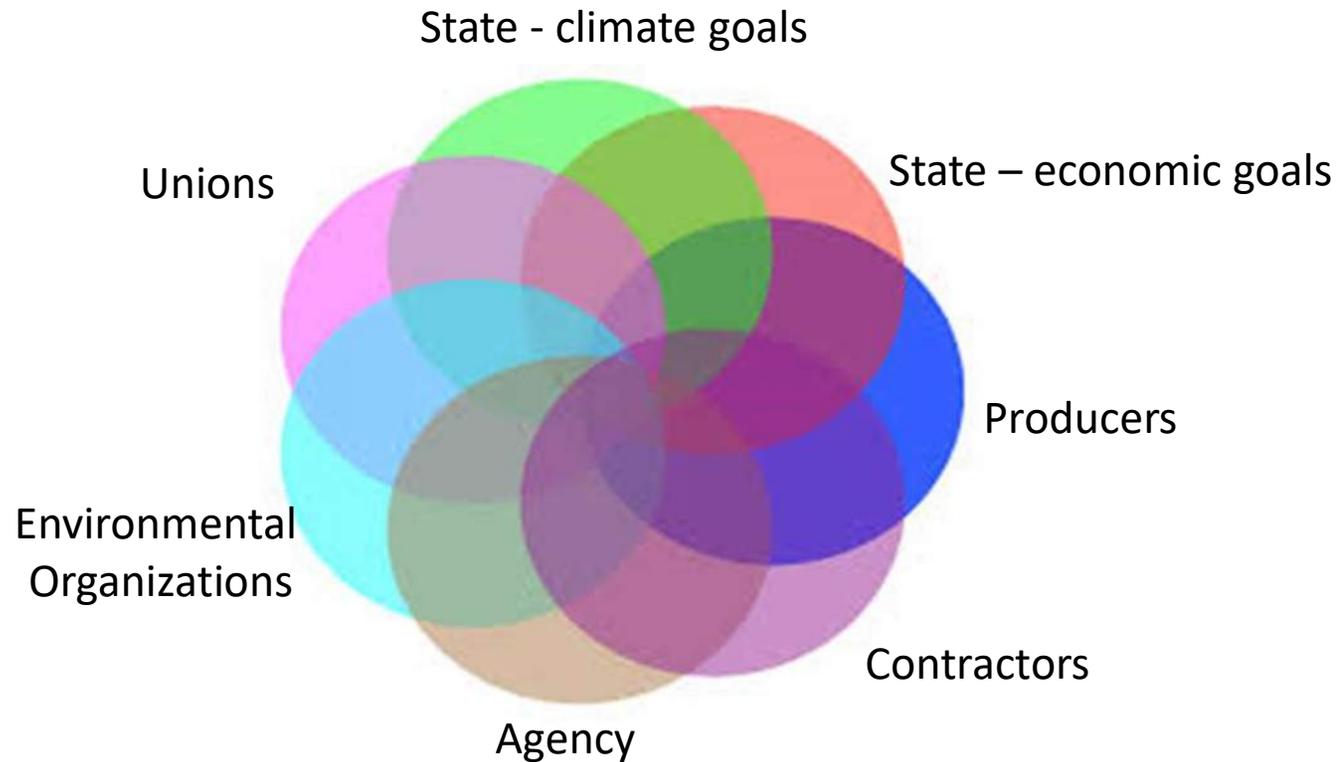


Passing Buy Clean California

- Address the needs of different groups
- Strong coalition of labor, environmental groups, businesses
- Ease to implement



Buy Clean-Balancing Lots of Needs



Balancing diverse needs will be critical in the COVID era

Buy Clean in action

- National policy
- Other states
 - Oregon
 - Minnesota
 - Colorado
- Local CA cities
- Research is ongoing



Buy Clean 2.0: WA State Buy Clean/Buy Fair

Similar to CA = proposes that WA state agencies awarding construction contracts require environmental product declarations (EPDs) for an eligible list of materials.

Builds of CA = Incorporate emissions information and disclose labor information to level the playing field for companies that are good to their environment and workers



Thank You

Contact Information

Jose "JB" Tengco

Western States Director

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Key Websites

About the CA policy

www.buyclean.org/buy-clean-california

Buy Clean CA implementing agency

www.dgs.ca.gov



BLUEGREEN
ALLIANCE



BUY CLEAN FEDERAL LEGISLATION: OVERVIEW AND PATH FORWARD

Michael O'Connor, Ph.D.
Science & Technology Policy
Fellow
Office of Congressman Paul D.
Tonko (D-NY)

FEDERAL MOTIVATION FOR BUY CLEAN

Product of good timing (pre-masked days)

- Democratic Midterm election wins prompted widespread legislative interest in climate action
- However, not a lot of consensus on WHAT 'climate action' means
- Multiple attempts to build that consensus:
 - House Select Committee on the Climate Crisis – report pending
 - House Committee on Transportation & Infrastructure – climate-friendly pipeline and highway bills
 - House Committee on Natural Resources – Carbon-Neutral Public Lands
 - **House Committee on Energy & Commerce: CLEAN Future Act**

FEDERAL MOTIVATION FOR BUY CLEAN

CLEAN Future Act

- First attempt at an *economy-wide* decarbonization bill since Waxman-Markey (2009)
- Combination of regulatory provisions, grant programs, and R&D
- Text was released as a discussion draft
 - Seeking comment
- Titles that reflect different economic sectors:
 - Power
 - Buildings
 - Transportation
 - Environmental Justice
 - ***Industrial***

BUY CLEAN

The pillar of the Industrial title

- From the press release:
 - “The CLEAN Future Act **establishes a Buy Clean Program** that sets performance targets to steadily reduce emissions from construction materials and products used in projects that receive federal funding. With the vast majority of U.S. construction projects funded by government dollars, this proposal would transform these carbon-intensive industries by ensuring that these projects only use the cleanest construction materials. The program also strengthens the competitiveness of the U.S. manufacturing sector while reducing climate pollution by promoting the use of low-carbon materials and expanding the market for cleaner products.”
- Public sector purchases an enormous amount of construction materials
 - ~90% of cement and concrete
 - ~50% of steel

BUY CLEAN STRUCTURE

- Combination of standardization, data collection, and regulatory
- Standardization
 - Requires all federal contracts to obtain EPDs for their products
 - EPDs must be:
 - Facility-specific
 - Demonstrate the embodied carbon emissions of the eligible material
 - Adhere to the single product category rule designated for that specific material by the EPA Administrator
- Data Collection:
 - For the first 3 years all contractors accepting Federal \$\$ must simply acquire EPDs for products being used in the project
 - Data to be housed in a Federal database within EPA:” National Environmental Product Declaration Database”
- Regulatory
 - Years 4-8: Exclude dirtiest 20% based on EPA Database Data
 - Years 9-13: ...30%
 - Years 14 – 18: ...40%
 - Years 19 – 23: ...50%

OTHER BUY CLEAN CONGRESSIONAL EFFORTS

Buy Clean Transparency Act (S. 1864, Klobuchar)

- Introduced July 2019
- Mandates an assessment of “how the products procured by the Federal contracting agency and any contractors of the Federal contracting agency in connection with a Federal contract **affect the levels of greenhouse gases in the atmosphere**”
- Requires each product to do so through a ‘climate product declaration’, which they specify
 - An EPD in another name

THE STAKEHOLDER LANDSCAPE

- Industrial Material Suppliers
- State governments who have already enacted this policy
- Academia (your network)
- Labor groups
- Federal procurement officials
- EPA
- Other groups to be included?

IMPACT OF COVID ON CLIMATE LEGISLATION

Two axioms:

- “Hurry up and wait”
- “Let’s see what happens in November”

COVID is still very much an emergency

- Difficult to legislate on a recovery when the recovery has not begun

However, when the recovery begins, it is likely that it will be infrastructure-heavy

- Good opportunity for Federal Government procurement

OPTIONS WE ARE CURRENTLY CONSIDERING:

‘BuyClean Lite’

- We still know very little about industry-wide emission data
- Idea: Data collection WITHOUT regulatory component
 - Voluntary program to begin to collect information

‘Reshoring’

- Many industry production jobs have gone offshore, to countries with dirtier production mechanisms
 - Steel is highlighted
 - Chemical products as well
- Idea: Devise a reshoring bill to more strongly promote American industrial capability, with there being ancillary climate benefits to arise from that.



HOW YOU CAN HELP

Connect us to all the interest groups needed

Connect to the interest groups and sell the idea of cleaner products as a future job creator

Increase awareness in an organized way

Interact with Members of Congress and other levels of government who would be receptive to this idea, but might not be aware of it



THANK YOU!

Michael O'Connor

Science & Technology Policy Fellow, Office of Congressman Paul Tonko (D-NY)

michael.oconnor@mail.house.gov



Q&A

Thank You!

Network | 2020 Webinar Series



carbonleadershipforum.org/embodyed-carbon-network



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[@CarbonLeadForum](https://twitter.com/CarbonLeadForum)