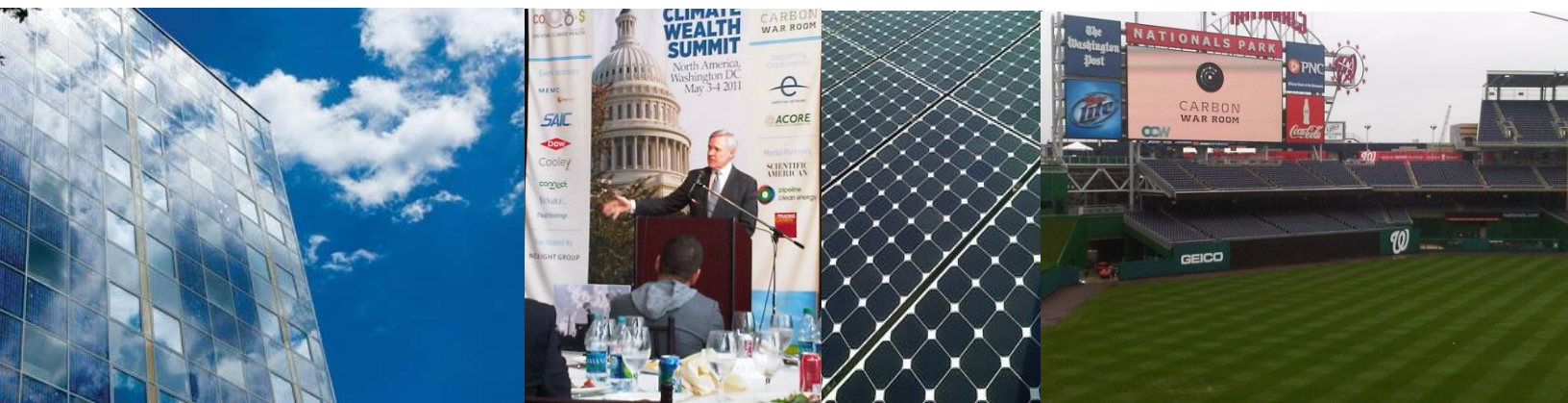


ACCELERATING THE DEPLOYMENT OF CLEANTECH SOLUTIONS



CREATING CLIMATE WEALTH SUMMIT

North America,
Washington DC
May 3-4 2011



Post-Conference Report





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On May 3-4, 2011, the Carbon War Room convened executives, investors, academics, entrepreneurs, and select leaders from the public sector for the 2nd annual Creating Climate Wealth Summit. The premise of the Summit was that growth rates in the cleantech sector are not yet substantial enough to provide sufficient climate change mitigation needed to achieve stabilization targets and also needed to support sustainable economic development.

During the two-day Summit, leaders were broken into seven working tracks for roundtable discussions hosted by professional facilitators. These working tracks included Distributed Generation, Energy Efficiency in the Built Environment, the Future of Personal Transportation, Island Economies, Aviation & Renewable Fuels, Shipping and Freight, and Sustainable Agriculture.

The specific goal of the Summit was to identify the critical market barriers inhibiting industries from achieving large-scale emissions reduction and to develop strategies for overcoming barriers in these seven working tracks. Each group identified:

The Summit provided a forum for determining opportunities for accelerated deployment of cleantech solutions and remaining obstacles. During the discussions, emphasis was placed on ensuring that the various technologies are scaling in a way consistent with sustainability goals, including carbon mitigation.

- The top barriers to accelerated market growth.
- Opportunities to accelerate deployment of cleantech and renewable energy solutions.
- The operational pathway to achieve substantial emissions reduction by 2020.

This report contains the results of those working track discussions. The following sections contain brief summaries of key themes and major findings for each working track, followed by detailed tables representing the raw workshop results: barriers, potential solutions, and preliminary action plans for select solutions.

Objective

In addition to providing publicly available roadmaps for accelerating market development of these cleantech and renewable energy solutions, the Summit findings will form the basis for the Carbon War Room's and its partners' work over the next year. The purpose of this report is to serve as the foundation for evaluating the solutions identified by working tracks at the CCW Summit. Specifically, this report will accomplish the following:

- Serve as the inspiration for Carbon War Room operations.
- Serve as the basis of reference for ongoing evaluation during subsequent CCW Summits (CCW Australia, July 2011 & CCW London, September 2011).
- Provide the basis for analyst reports that fully evaluate highest priority solutions and add further insights on implementation. These reports will be distributed to CCW Members, who will also be consulted and cited throughout the process.

Working Track: Distributed Generation

Distributed Generation | Overview

The distributed generation group was asked to consider all distributed generation options throughout the two day workshop, including solar, wind, combined heat and power applications, among others. The term “distributed generation” was defined in consensus as “applications of less than or equal to 12 kilovolts (kV).”

The group first identified market barriers to gigaton-scale carbon emission reductions in domestic distributed generation within today's existing regulatory and policy framework. Barriers were identified in four broad categories: education and training, technical, financial, and standardization.

Within the education and training category, the group stated that the general public does not commonly perceive distributed generation as a potential solution for significant carbon reductions. The technical terms related to distributed generation are not well understood. Therefore, they concluded that efforts should be made to and use more consumer-friendly mass marketing campaigns with simplified language, such as “solar shingle” instead of solar cells or modules. Other major barriers include lack of training available to hosts, users, regulators, and manufacturers and, correspondingly, a lack of interest from the public to receive such training. The group also found that there is a need for an information sharing resource to disseminate information about distributed generation best practices, barriers, solutions, system compatibilities, and standards.

Participants

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Top Barriers to Creating Climate Wealth | Distributed Generation

Technical barriers the group identified include distributed generation system compatibilities, system integration, and interoperability issues. Limited energy storage options and capability to distribute to the grid also present major technical barriers.

The group identified a lack of long-term capital, the illiquidity of distributed generation projects, and various financial risks as major financial barriers, all contributing at the macro-level to the need for appropriate solutions that will enable DG to stand alone as a viable asset class. Financial risks include the instability of financial incentives, a lack of consensus about the allocation of risk among parties, the uncertainty of the longevity of companies involved, lack of warranties, and the reliance on borrowers to perform and be able to obtain rebates.

Standardization barriers identified include a lack of standard financial offerings and consistent interconnection standards and structural issues around permitting and financing, which can delay projects for several months. Table 1 shows the complete list of barriers the group identified.

Table 1. Barriers to Scale-Up of Distributed Generation

Education and Training	<ul style="list-style-type: none"> • Language barriers for consumers, such as technical terms. People may not understand the terms “modules” or “cells.” However, they may understand the term “solar shingle.” There is a distinct need for unified and accessible messaging. • Lack of training of hosts, users, regulators, and OEMs. • Lack of interest from the public to get trained. • Need for a resource to share solutions and best practices to overcome barriers to the implementation of distributed generation, such as compatibility and standards. • Public priorities are not focused on distributed generation solutions. • Potential end users are unaware of the large opportunity for distributed generation that could benefit their bottom line. • Plant managers may not have the knowledgebase to consider distributed generation for their plant.
Technical	<ul style="list-style-type: none"> • System compatibilities, transmission lines and distribution issues at point of load, system integration, interoperability issues. • Storage and capability to distribute in the grid. • For solar projects there can be a risk of shading through the life of the project.
Financial	<ul style="list-style-type: none"> • Lack of project finance capital. • Illiquidity of DG investments – capital can be tied-up to projects for a very long time and there may be no clear exit strategy. • Complexity of monetizing tax benefits of projects. • Poor understanding of risk and reward in the investment community, which can result in higher cost of capital. A third-party rating agency for distributed generation projects that do not exist. At the same time, rating agencies are not being supplied with performance data of DG projects. • Overleaping and aging regulations that conflict with some of the newer projects. • Instability of policies and financial incentives which may go away before the reward can be realized. • Lack of consensus on allocation of risk among parties. • Uncertainty of the longevity of companies involved and lack of warranties . • Gap between perceived and real risk. • Underwriting-utility risk– reliance on borrower to perform and be able to obtain rebate. • Lack of normalization in documentation for financial transactions related to distributed generation.
Standardization	<ul style="list-style-type: none"> • Structural issues around permitting and financing, which can delay projects several months. • Lack of consistent interconnection standards multiply the risk (and costs) associated with the structural permitting and financing issues. • Lack of standard financial offerings.

Key Solutions | Distributed Generation

Members of the track then formed subgroups to identify potential solutions to overcome the identified barriers. Subgroups were formed around the same categories of barriers previously identified (education and training, barriers, technical, financial, and standardization).

To overcome educational barriers, the group proposed the formation of a trade association for distributed generation that would unify other like-minded approaches across the trade association landscape, message consumer and end users, provide training, create a database of distributed generation projects, and develop carbon reduction metrics.

To overcome technical barriers, the group suggested the development of a pool of performance data, the creation of technology roadmaps, and the formation of a self-insured pool for risk.

Several solutions were identified to help overcome financial barriers. To provide access to patient, long-term financing, a system approach to financing could be developed to match the financing needs of each stage with various financing mechanisms. The group also proposed the formation of an organization to protect investors against risks involved in distributed generation projects.

To overcome standardization barriers, the group suggested the development of a system to simplify the process of ownership. This system would also reduce transaction costs by harmonizing permitting requirements, the creation of standardized financial offerings, and standardization among state Renewable Energy Credit (RECs) programs. Table 2 shows the complete list of solutions the group identified.

Table 2. Market Transformation Strategies for Distributed Generation

Form a DG trade association	
Aggregate industry data	Aggregate data even if on an anonymous level, so that rating agencies can rate debt. Work with utilities to aggregate grid data to identify a map where the grid is already strained so that DG can be deployed in highest need areas.
Create a training program for all stakeholders	Build a name and recognition to attract capital to the industry. A unified label, market, and pitch builds confidence in investors and insurers. Create a training program for everybody from regulators to OEM's on the warranty and lending processes.
Increase Access to Capital, Improve Viability of DG as an Asset Class	
Create a "Solar FDIC"	Lower the actual and perceived risk of investing in solar by creating a solar FDIC to insure projects to a certain level. This will be funded by having all manufacturers put a small amount of money into a pool for risk. This will protect against the risk that manufacturers of solar products will go out of business and that their warranties will become defunct.
Create liquidity in the market for distributed generated assets	Create an insurance mechanism against regulatory risk in the US. We do not know how to securitize these assets because we do not know what investors are looking for, and they do not understand the solar terminology, so they do not know what to communicate to us. Solution is to call up large banks and ask them to help define what criteria they are looking for in investments. That will allow them to be the secondary market maker.
Standardization	
Create a language around DG and solar	Look to other industries for success stories. The telecom industry for instance has created a vocabulary around cellular phones that everyone understands. Nobody understands what cells, modules, and inverters are.
Define standard financial product	Create a standard product that banks can buy, approve, and accept. Harmonize the laws amongst states and create a federal standard to minimize transaction costs. Create a standard contract that consumers can understand easily instead of having a different contract for every company. Insurance companies want standardized products and are not going to change the way they operate to accommodate solar.

Action Planning | Distributed Generation

The group then consolidated solutions they identified into plans that would have the greatest impact. Participants were asked to consider which of the identified solutions could be implemented and create wealth on a path to achieving a gigaton-scale carbon reduction in a 12-18 month timeframe.

The group agreed that standardization improvements are a crosscutting issue that should not stand alone as a major potential solution but should be integrated in other solutions. The formation of a trade association was identified as a high-impact solution to overcome education, training, and standardization barriers. Two solutions were identified as having the greatest potential to overcome financial barriers. The first these solutions is to develop an insurance product to mitigate the risk of non-performance by the host site. The second solution is to develop debt and equity products and tools to connect long-term debt and equity owners to early-stage projects. Table 3 summarizes the top three identified solutions.

Participants were then asked to form three working groups to develop implementation plans for each of the three solutions identified as having the greatest potential.

Table 3. Summary of Top 3 Identified Solutions	
Education, training, and Information sharing	Create a unifying branding initiative to drive messaging, standardization, and best practices through the distributed generation value chain
Financial	Develop insurance product that backstops "site risk;" the risk that host will continue to operate (e.g., industrial thermal offtakers for combined heat and power, real estate occupancy for solar installations, etc.). This could be achieved with insurance companies, but more likely with the creation of self insurance funded by participating projects; payable to project in the event of site risk default. Payout would be tied to capital recovery and amortized over time to protect underlying equity rather than long-term cash flows.
Financial	Develop debt and equity products and tools to more efficiently connect long-term debt and equity owners to early-stage projects.

Strategy: Develop or leverage a global trade association platform for collaboration to drive messaging, metrics, standardization, and best practices through the distributed generation value chain.

Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Baseline existing policy, education, and market based organizations addressing common barriers and interests consistent with a gigaton scale carbon reduction for distributed generation to achieve a \$10B increase in capital deployment in under 18 months • Determine operational framework and/or various options on how to collaborate • Determine funding requirements and funding sources
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Convene actors (in person or virtually) in less than 6 months • Baseline and survey common barriers/interests in less than 90 days • Determine operational model complete with funding model in less than 9 months <ul style="list-style-type: none"> ◦ Include an operating plan, priorities, metrics, messaging ◦ Categorize impacts – standards, best practices, etc.
Climate Wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> • Accelerate adoption of DG solutions by 50% more than otherwise would be done without standards or best practices • Remove \$400-500MM of red tape from the solar DG market as a wedge approach to increase efficiencies in other adjacent DG markets (wind, biomass, CHP, etc) • Innovation with respect to system monitoring, IT, SW platforms • Interoperability at the point of connection, and systems integration
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • DG track forum #1 convenes • Develop operating plan of less than 12 months • Define methodologies for metrics to translate investment capital \$ → MW → CO₂ reduction • Universally recognized ratings system (index)
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • National Association of Regulatory Utility Commissioners • U.S. Green Building Council (ratings system) • National Association of State Energy Officials (ratings system) • National trade associations (for DG elements) • Airborne Wind Energy Industry Association
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • National advocacy groups • Department of Energy and Energy Information Administration • National Renewable energy Laboratory • National institute of Standards and Technology • Institute of Electrical and Electronics Engineers <p>Call to action – Outreach for best practices, leverage, adoption, data reporting</p>
Next steps <i>What Should we do right away?</i>	<ul style="list-style-type: none"> • Baseline the market, survey *.orgs on current initiatives, and convene other actors sharing common interests <6 months

Strategy: Develop insurance product that backstops “site risk;” the risk that host will continue to operate (e.g., industrial thermal off-takers for combined heat and power, real estate occupancy for solar installations, etc.). This could be achieved with insurance companies, but more likely with the creation of self insurance funded by participating projects; payable to project in the event of site risk default. Tie payout to capital recovery and amortize over time to protect underlying equity rather than long-term cash flows.

Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Outreach to insurance industry. Find a way to adapt current projects to meet this need • Organize distributed generation coalition to create framework for industry-wide insurance product, eligibility, pricing, etc.
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Research potential for federal underwriting • Develop tools/metrics to quantify counterparty risk
Climate wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> • Will backstop the biggest uninsurable default risk • In the long run, distributed generation insurance could become profit center in its own way
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Higher closing rates • Lower cost of equity for distributed generation projects • Develop “Insured DG” brand with value to financial community
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • Developers – has to be led by companies touching end-user and equity source
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • Partner with local business schools, lenders insurance companies: identify people we could leverage • Federal government – Could provide backstop risk in a similar loan guarantee program • Engineering firms that specialize in site risk
Next Steps <i>What Should we do right away?</i>	<ul style="list-style-type: none"> • Develop tools and metrics to quantify host risk.

Strategy: Develop debt and equity products and tools to more efficiently connect long-term debt and equity owners to early-stage projects	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Define a step-wise framework to reach the “long-term, patient, cheap money” • Perform current state vs. desired state gap analysis • Shape distribution channels, define criteria, leverage knowledge
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Distributed generation renewable energy megawatts deployed in less than 12 months • Rated commercial paper
Climate Wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> • Capture big portion of global energy market • Reducing and stabilizing long-term energy costs • Returns uncorrelated to hydrocarbons
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Megawatts deployed • More industry consolidation driving innovation • Publication of successful projects • Utilities switching to “new game”
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • Bond money players, such as Goldman Sachs, JP Morgan, Barclays, Citi • Specialty financing shops: driving consolidation
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • Regulatory providers • Utilities • ESCOs and EPCs • Insurance providers
Next Steps <i>What Should we do right away?</i>	<ul style="list-style-type: none"> • Get to work and show success

Working Track: Energy Efficiency in the Built Environment

Energy Efficiency in the Built Environment | Overview

Building on the work of last year's summit, the Energy Efficiency Track focused on the barriers and opportunities to increasing the flow of capital into commercial and residential energy efficiency retrofits, resulting in several concrete action recommendations. The group started from the assumption that return on investment from energy efficiency retrofits that are financed using a mix of debt and equity is sufficient to unlock billions of dollars in institutional capital. Yet, an informational gap exists in the market regarding the savings that retrofits actualize vs. the perception that "there is no way to measure savings." The working track encompassed members of the financial, real estate, municipal, and insurance industries, providing an interactive and collaborative platform for a high-level and granular discussion about the myriad tools the industry has to overcome barriers and tangible steps forward.

Participants

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Top Barriers to Creating Climate Wealth | Energy Efficiency

Demand for energy efficiency retrofits --- whether speaking about municipal, residential, or commercial sectors --- has largely been hampered due to lack of information about retrofit opportunities and the inability to either provide upfront capital to perform the retrofit or incur additional debt levels. Given that most utilities are in the business of selling kilowatts of energy, their business models often create disincentives for reduction in energy consumption.

Downstream, the industry has done an ineffective job of explaining the energy efficiency value proposition to lenders, regulators and consumers, resulting in an assortment of approaches without systematic cohesion. While many consumers believe that energy efficiency is the “low hanging fruit,” few have been given a turnkey solution that makes financial sense from day one. Since the financial crisis in 2008, banks have become incredibly adverse to risk and the energy efficiency industry has not proven capable of overcoming the credit and performance risks that bankers often cite as the two leading obstacles to funding retrofits. Furthermore, this problem is compounded by the relatively small scale average size of retrofit projects. Whereas Citigroup bankers might not look at a deal under \$50MM, the average residential retrofit is less than \$10K. Aggregating and scaling retrofits to become attractive to large capital providers remains a significant obstacle.

Finally, there is a perception in the marketplace that since every building has a different envelope, size, shape, and use, the data that emerges from these buildings are not comparable to other buildings. On top of this, the industry has historically declined to offer guarantees on the savings from retrofit interventions (other than the flawed ESCO model), compounding the perception that objective and standardized metrics that can evaluate energy efficiency savings do not exist.

While these barriers are not new, they do highlight market conditions and dynamics as the focal points for action. The group also recognized that an important consideration for addressing the barriers and improving the market is engaging and addressing the needs of multiple stakeholders – end users, investors, local government, utilities, providers, regulators. Collaboration among stakeholder groups – most of which were represented by the participants in the breakout group – is critical to developing and implementing workable solutions.

Key Solutions | Energy Efficiency

To address the barriers, the group generated multiple ideas for solutions. These were pared down to three. The first was to promote off balance-sheet, non-PACE based solutions. Off-balance sheet models are attractive, as they shift energy efficiency upgrades from a capital expense to an operating expense. While the building owner loses the ability to depreciate the capital asset, this is offset by the gain from not having to encumber one's debt load. The group promoting off-balance sheet equity fund-type models identified the War Room's capacity to convene relevant parties via trade delegations and/or city-based vendor presentation days. Such convenings can provide general information about energy efficiency opportunities for building owners while facilitating specific introductions to companies with turnkey solutions.

The second idea was to implement an initiative to re-brand commercial PACE. This solution recognized that PACE is a viable mechanism that is already deploying tens of millions of dollars in California. The main challenge is to increase the confidence of lenders that the creditworthiness of the mortgages is not impaired by PACE liens. The PACE Commercial track concluded that the lingering stigma surrounding PACE due to FHFA letters requires a complete rebranding of PACE Commercial. New acronyms included CEEF (Commercial Energy Efficiency Finance) and CAP Bonds (Commercially Assessed Property). In addition to renaming PACE, the group concluded that a multi-million dollar marketing and communication campaign was required to reset the public's misunderstanding of this innovative financing tool.

The third solution was to develop and define uniform standards for data delivery to support decision making. This solution recognizes the importance of actionable and usable data to the marketplace. Those advocating for a software-as-a-service solution highlighted the War Room's unique role as a company-agnostic entrepreneurial NGO. In this role CWR facilitates the convening and sign-off of an industry-wide measurement and verification system. Additionally, the group advocated for publicly disclosed benchmarking and installation of real time "smart" metering. Without access to the real-time meters, building owners and tenants often do not understand their energy consumption habits and the potential software interventions that can reduce energy use 8-30%.

Participants worked in three groups to develop detailed plans to implement these solutions. More importantly, the summit brought together the necessary stakeholders. Participants remained highly engaged and gained experience collaborating across stakeholder lines.

Table 1. Market Transformation Strategies for Energy Efficiency in the Built Environment	
Market Standardization	
Benchmarking & Audit Requirements	Cities should look at the benchmarking required in NYC, Washington DC, and San Francisco as models for obtaining information about building stock performance and inventory
Carbon War Room convene industry platform on M&V	Using CWR's unique platform at the nexus of capital, cities, and industry, CWR could develop a universal M&V standard that parties across value chain could agree to and implement
Rebrand PACE Commercial – CEEF or CAP	
CEEF or CAP	Commercial Energy Efficiency Finance (CEEF) or Commercially Assessed Property (CAP) – PACE has become an acrimonious association for customers and lenders due to the fact that PACE residential was shut down by FHFA in 2010.
Market CEEF or CAP	Industry needs innovative marketing strategy to explain to municipalities, financiers, and building owners that PACE Commercial is a qualitatively different value proposition than PACE Residential.
Promote Off-Balance Sheet Models	
Non-Partisan Convener	Due to inability for municipalities or corporations to incur additional balance sheet debt, companies such as Transcend Energy, Metrus, and Green City Finance have developed innovative financing models that overcome upfront capital costs, split incentives, and balance sheet considerations. The Carbon War Room is uniquely positioned to act as a non-partisan convener of actors in the EE realm.

Action Planning | Energy Efficiency

In the final session participants identified the highest priority solutions for the group, including the Carbon War Room and its partners, to pursue after the workshop. Working Track groups then developed action plans for implementing these high priority solutions.

Table 2. Create Measurement and Verification Protocol

Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<p>The intention is to create an industry-wide method of evaluating data measurement and reporting that is consistent and universal. In order to accomplish this, we must first understand the scope of disaggregation and identify the relevant stakeholders necessary to rectify the problem.</p>
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Establish clear industry metrics and standards • Obtain institutional signoff from key members of industry value chain including: federal, state, and city governments, technology companies, financial institutions, and non-profits.
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Identify key stakeholders • Determine what each stakeholder needs for satisfaction • Assess inventory of current M&V protocols (Energy Star Portfolio, etc) • Create regular roundtable working group • Group signoff on standards • Institutional signoff • Promotion by leaders of industry
Partners <i>Who else should be involved? What should they do?</i>	<p>Scientific Conservation, C3, Hara, Lockheed Martin, Deutsche Bank, EDF, Transcend Equity, Energi</p>

Table 3. Rebrand PACE Commercial

Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> Interested parties in advancing PACE Commercial convene a meeting to rebrand the financing mechanism
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> Industry-wide adoption of new acronym \$5M spent on media and advertising \$500M worth of projects developed in 2012
Allocation of Capital <i>Where will the funding come from?</i>	<ul style="list-style-type: none"> Capital will be used to convene key stakeholders in a one-day meeting on how to rebrand PACE Commercial and the next steps in a large-scale marketing and outreach campaign targeting municipalities, financiers, and building owners.
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> Identify and convene all relevant stakeholders Agree on a name that is relevant, catchy, and does not evoke the negative connotations of PACE Residential Innovative marketing campaign
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> YGrene, Clean Fund, Energi
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> Cities of San Francisco, Los Angeles, and Washington DC, Sonoma County, PACE NOW, Renewable Funding, Urban Atlantic

Working Track: Future of Personal Transportation

Future of Personal Transportation | Overview

Personal transportation in the United States shifted over time from cities that were very open, people-oriented, and multi-modal to highway-based urban spaces that encourage reliance on single modes of transportation, particularly personal vehicles. As a result, the transportation sector is now responsible for 23 percent of global CO₂ emissions from fossil fuel combustion, representing approximately 15 percent of overall GHG emissions.

People today are moving back into the cities from the suburbs, creating a reason to transition back to multi-modal transit, rethink our urban spaces, and consider a greater mix of small, personal vehicles: enhanced electric bikes, mopeds, golf carts, and shared cars. The Future of Personal Transport working track focused on developing consumer-focused, service-based models that utilize existing technologies and infrastructure to achieve gigaton-level carbon reductions in five years.

Participants

Track Chairs:

Gabe Klein, Commissioner, Chicago Department of Transportation

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Alison Cohen, President, Alta Bicycle Share

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Top Barriers to Creating Climate Wealth | Personal Transportation

While service-based models for personal transport have proven successful through companies such as Zipcar and Capital Bikeshare, a significant amount of additional consumer adoption must occur before gigaton-scale reductions of CO₂ can be reached. Participants began the working track by identifying reasons why new business models for personal transport fail. The top barriers include the following:

- **Consumer mindset and achieving critical mass** – Consumers inherently fear change, and those who are used to relying on personal vehicles are difficult to convince otherwise. These consumers value their time and are not willing to give up the perceived reliability of their car to become early adopters of an unknown and perhaps complicated service, such as the public bus system. Consumers also value ownership, particularly in America, and truly enjoy the emotional experience of buying a car. Because service-based models rely on a network effect for scale-up, convincing consumers to participate and achieving critical mass can be a significant barrier.
- **Implementing physical infrastructure** – Particularly for programs like rideshare and bikeshare, physical infrastructure needs to be financed and implemented into space that is often owned by the government. Nodes, bike lanes, HOV lanes, parking spaces, and other infrastructure are expensive and difficult to implement due to political and financial restraints. These difficulties pose a substantial barrier to any service-based model that relies heavily on such infrastructure.
- **Regulations, policy, and special interest groups** – In addition to owning much of the space and services included in service-based models, governments also have a number of policies, laws, and taxes that can discourage consumers from participating in and entrepreneurs from attempting to develop and implement such programs. Special interest groups also influence the government in ways that upstart personal transport companies cannot. It is difficult and time consuming to change any of these aspects of government, all of which can inhibit the development of service-based models.

Other barriers discussed include the following:

- **Disconnect between creating and implementing ideas** – Many new service-based models are not able to succeed due to a lack of due diligence in gauging consumer acceptance during the design phase. If inventors and idea generators do not consider the commercialization process (timing, marketing, and costs), use a systems approach, or make interfaces easier for consumers to access in the design phase, it could prevent consumer acceptance and inhibit implementation.
- **Investor reluctance** – Similar to consumers, investors also need to buy into service-based models to ensure success. There needs to be a way to explain to investors that these models are a smart, safe investment based on adoption rate data, which is difficult to obtain for new models. Investors also have a perception of risk associated with service-based models— theft and vandalism of shared transport devices, liability associated with inexperienced users, and the financial risk, particularly if government is not playing a role. Personal transport companies also tend to lie in a middle ground between venture and private equity, making it difficult to determine the right type of investor.

Role of Government in Personal Transport

An important step in developing and deploying successful service-based models for personal transport is clarifying the role that government can and should play. While government is needed in some areas to ensure success, entrepreneurs and investors need to make sure that they are not relying too heavily on government policy and regulation to get their ideas off of the ground.

According to working track participants, government at all levels needs to provide incentives where possible that can encourage consumers and companies to explore using and selling personal transport services, but should avoid doing so in a way that picks winning and losing technologies by incentivizing a mix of modes rather than a specific product. Participants also indicated that there is a need for local government to provide visioning for the integration of systems at a local level and to assist pilot efforts by supporting the demonstration and testing of new technologies. By doing so, local governments can help facilitate services without defining them. Participants also noted that governments should keep supporting transit as a line item in budgets and help shape, build, and house infrastructure (such as the electric stations in Japan in partnership with Nissan), to assist the private sector in getting the ball rolling on projects. Government should not, however, initiate necessary changes like consumer mindset—this should come from the private sector.

Key Solutions | Future of Personal Transportation

Working group participants determined a number of business models for the future of personal transport. Solutions focused on service-based models that were filtered to ensure they: 1) are easily transferred; 2) will result in a one-gigaton carbon reduction; 3) are deployable and will reach gigaton-reduction scale in five years; 4) have a positive ROI. While some participants suggested solutions involving the development of technology that, for example, would enable better integration and return of power to the grid via better batteries or grid-integrated electric car charging stations, these solutions were deemed to involve the development of new technology and were, therefore, out of scope.

Participants selected priority solutions that can work together to achieve “smart mobility”—a systematic approach to transporting people that moves away from isolated modes of transport. The high-priority solutions identified by the working track include the following:

- **Travel aggregator** – Using an application on a smart phone, the aggregator would provide a “mobility bundle” of information to consumers about travel options in urban areas including walking, biking, transit, personal cars, car sharing, taxi ride sharing. A consumer could, for example, digitally hail a taxi or bus or bikeshare, slug for a carpool ride electronically in a way that is integrated with social media to remove some of the risk of riding with a stranger, and have all of their public transit cards in one place along with a discount for using the service. The aggregator would not involve any new physical infrastructure and could incorporate a charge per transaction or GIS-based advertising to create wealth for those providing rides and for the company selling the service. Making it easy for consumers to access information will enable more people to use multi-modal and rely on transport, reducing emissions.
- **Turnkey telecommuting package** – This turnkey package is something that companies could buy to encourage their employees to not travel to work in the first place. This solution would involve packaging items such as internet access, a phone line, and cloud computing services together along with consulting services that could help the company choose the best option to fit their needs. The seller of this initiative might also install the needed technology in the home of the consumer or work with the participating company to set up satellite offices where it would make the most sense for in-person meetings when needed. Effectively, this solution would appeal to employers by increasing happiness and, therefore, productivity while reducing daily urban traffic by creating opportunities for people to not have to drive to work five days a week.
- **Corporate transit system** – As part of the Travel Aggregator and the Turnkey Telecommuting Package applications, working track participants determined that large organizations such as corporations could serve as first adopters by participating in pilots and adopting these programs as part of a “corporate transit system.” This system would both encourage early adoption of these programs and help employers subsidize the cost of transportation for their employees, increasing happiness and productivity while cutting carbon emissions. It could also include corporations providing transit for their employees to and from work, similar to Apple and

Google, with energy-efficient cars, such as electric cars, on site in case they employees need to leave work during the day.

Other key solutions identified during the working track include the following:

- Conversion of USPS fleet – Using business-to-business transaction, USPS could serve as an early adopter and model for fleet conversion to existing alternative fuel vehicles. USPS has already investigated and determined a cost savings with the use of alternative fuel vehicles, but is in need of investors. Using electric vehicles could create additional climate wealth by giving back to the grid at night.
- Point-to-point car sharing – While point-to-point car sharing is already up and running (e.g., car2go) these efforts could be substantially ramped up via public-private partnerships with car manufacturers. Consumers already feel comfortable and safe using these cars; large-scale point-to-point car sharing would simply encourage more use.

Action Planning | Future of Personal Transportation

In the final session, participants developed action plans for implementing the high-priority solutions they identified. These action plans are provided below:

Strategy: Provide consumers with information on multi-modal transportation options to encourage them to rely less on personal vehicles and “fill seats” via rideshare and increased use of public transportation.	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Define a revenue model and marketing strategy • Build, acquire, and aggregate platforms and build a prototype • Build partnerships by speaking with large organizations about seed funding and using their employees for a pilot • Gather information • Build usage (e.g., first million users get share of company; every time you use it, you build up discounts with a retailer; every time you use it you're entered into a lottery) • Acquire customers and launch
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Numbers of users • Number of clean miles daily • Working platform • Working algorithm for combining and creating options increase in number of users and carbon offset
Climate wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> • \$450B in variable cost • Take share of cost avoidance/advertise/subscription. • Half of cost is commuting (37% of CO₂ emissions could be reduced if car-pooling is doubled)
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Positive first use • Moving habit from mode to information • 4% decrease in emissions
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • Developers – has to be led by companies touching end-user and equity source
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • Auto manufacturers • Retailers • Federal government • Users/equity holders

Strategy: Reduce daily urban traffic by creating opportunities for people not to have to drive work five days a week.

Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Develop transferable models for business, cities, corporations, and schools • Determine locations for regional workplace centers/satellite offices (ability to co-locate regional workplaces with universities, libraries, etc.) • Facilitate home-based businesses and work/live communities within cities
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Reduction in number of car journeys per day/week/year • Track business licenses for home-based businesses • Track building permits for work/live spaces
Climate wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> • Opportunities for consulting companies to facilitate cultural changes for employers and employees • Development of regional remote workplaces • Opportunities for new technologies development
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Raised productivity • Reduced congestion • Corporate productivity rise and reduced facilities expenses • Employee happiness index • Fewer accidents
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • Large corporations that employ in the suburbs • Consulting entrepreneurs • Development companies
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • City governments • Boards responsible for tracking business licenses for home-based business and building permits for work/live spaces • Chambers of Commerce • Transportation authorities

Strategy: Subsidize employee travel to work to increase their happiness and productivity by adopting the travel aggregator, turnkey telecommuting, and other forms of low-carbon commuting.

Operational Pathway

What are the major tasks, phases, or steps that form the operational pathway for this strategy?

- Conduct an integrated briefing and sign-up
- Adopt a real-time data exchange/application programming interface that pulls transit, bike, and car sharing together

Milestones

What 2-4 milestones can we use to measure progress along the operational pathway?

- Sign-up and adoption rates
- Increase in utilization of many modes, demonstrated by usage spikes in other forms of transport

Keys to Victory

What factors will determine success? How will we know when we are winning?

- Demonstrate additional worker productivity

Working Track: Shipping and Freight

Shipping and Freight | Overview

The shipping and freight industry has evolved into an innovation leader. New technologies and ship designs that increase efficiency are increasingly becoming available. The “virtual arrival” system provides ships with information they need to reduce idling time spent waiting for free berths by reducing transit speeds, thereby saving energy. This is an example of a systems-wide approach that reduces carbon emissions through better information. Rising fuel prices, fuel quality issues, and the emergence of alternative fuels (e.g., LNG) are creating increased pressure and opportunity to consider efficiency investments.

Regulations continue to drive change in the sector, which faces a highly dynamic, global regulatory environment. Emissions control regulations aimed at sulfur are driving changes by 2015 that are likely to include a drive to increased use of distillate fuel in shipping. IMO, EU emissions schemes are moving slowly and will not be sufficient to drive carbon reductions in the sector on a time scale that climate science demands.

The North American Council for Freight Efficiency has focused on increasing ton-miles per gallon and has had successes. NACFE and others have compelling examples of truck fleets that have significantly increased ton-miles/gallon through creative approaches such as driver training and incentive programs.

Participants

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Top Barriers to Creating Climate Wealth | Shipping and Freight

The group briefly discussed the barriers that currently constrain widespread investments in carbon reduction technologies and practices. These barriers included the following:

- **Information gaps on new technology design and operational practices**, leading to mistrust among ship and freight owner/operators about new technologies. Many technology providers are pushing solutions with various levels of reliability and limited or no real-world test data on various ship or truck types.
- **Highly conservative and fragmented industry**, creating structural barriers to widespread investment in carbon reduction. Further, there are few good examples of short payback period investment opportunities, creating the perception of higher risk associated with investments in new carbon-reducing technologies. The limited number and capacity of shipyards provide a further structural bottleneck to widespread upgrades. To achieve maximum carbon reduction, legacy fleets and retrofits must be considered. To achieve widespread retrofits, many small fleets must make investments, but they are more capital-constrained than the large owner/operators.
- **Limited accuracy and precision on data**, metrics and methods to measure efficiency at an intermodal or systems level. A comparable metrics structure for the shipping and freight system does not exist, and access to high-quality data is limited, so efficiency is not a driving factor in decision-making for the sector. Data is not visible and transparent across modes.
- **Lack of a ubiquitous methodology to monetize carbon savings**, and disagreement on the metrics and measures most suited for assessing carbon reductions. Lack of common understanding about incentive schemes that allow incentives to flow through the entire supply chain.
- **No expression of value-added opportunities for more efficient freight in ways that resonate with consumers**, so consumers do not make decisions that provide incentives to owner/operators to invest in efficiency. Identifying the right constituents and delivering the right information to them is a major challenge. Can we adapt shippingefficiency.org to view shipping by Wal-Mart, Rio Tinto, or other major shippers, versus by carrier? This will resonate more with consumers.
- **Lack of understanding of ROI potential** for clean technology in shipping means too few banks, VC's investing / grasping initiative.
- **A lack of global standards for assessing carbon footprints** creates a lack of incentive between shippers and carriers to invest. There is no agreed-upon method for product labeling for supply chain carbon footprint of goods; lack of good data and tools for doing so, lack of value proposition for large multi-national retailers to build such labeling into their products.
- **A lack of consistent signals** (economic, market, or regulator) to drive investment in carbon reduction approaches.
- **Shipping “too distant” from gaze of international retailers** beyond carrier interpretation.

Key Solutions | Shipping and Freight

The group then discussed potential solutions to the most pressing barriers that would increase the flow of capital into the shipping and freight sector. Nine broad solutions were identified and voted upon to start to determine relative priority. These solutions can be grouped into three categories as shown in the following table:

Table 1. Market Transformation Strategies for The Shipping and Freight Industries	
Stakeholder Engagement	<ul style="list-style-type: none"> • Create incentives to use and improve data on ship efficiency by creating a commonly accepted metric. Expand data to a service basis that factor in routes – prioritize early efforts to focus on routes of greatest value • Reconfigure contracts between shippers and carriers to encourage shared investments in efficiency and carbon reduction (versus the sole focus on cost and risk that occurs today) • Market differences in ship ratings to strengthen communication to customers
Accelerating Progress and Investment	<ul style="list-style-type: none"> • Identify incubator sites for high-profile projects/demonstrations across all modes and conduct demonstrations on as many tools/approaches as possible • Create a mechanism (voluntary or regulatory) for a carbon market and direct revenues to fund R&D to create pipeline of proven technologies. Conduct trial/pilot project in specific regions (e.g., Arctic shipping routes, Los Angeles, Chicago) to prove mechanism and generate interest
Data and Tools	<ul style="list-style-type: none"> • Gather operational baseline data at finite level (e.g., individual truck or ship) and assess performance improvements from new technologies. This approach will provide actionable, visible operating (versus design) data that can be used to create credible case studies offering validated data regarding performance improvements • Create and scale up tools for purchase and operational decision making at company level and sector level. Requirements include transparent data and analytical tools that operate within individual modes and at intermodal/systems level • Establish a sustainability program for workers to provide training that enables workers to adapt to new technologies and practices. Such a program may be particularly important for union workforces • Create anonymous website for sharing test/other data on innovations to stimulate sharing sooner and more transparently. This should be a private-sector led effort, not a government or regulatory-driven process

Action Planning | Shipping and Freight

The group divided into three breakout groups to further explore the major categories of solutions identified as priorities. Efforts focused on planning around strategies to increase stakeholder engagement, particularly ports and shippers, but also a secondary tier including: shipyards, freight forwarders, shipbrokers and ports. Recognizing that opportunities will open up in the freight/container sector faster in some places than others, the group set out to create a strategy to speed up the process for industries and markets to meet those opportunities. In addition, the group determined that more accurate data and additional tools for analyzing efficiency data are also necessary to scale-up clean tech solutions in the shipping and freight sectors.

Strategy: Stakeholder Engagement (top priority: ports and shippers, second priority: ship brokers, insurance providers)	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> Delivering contracts (including port and charter party agreements) that incorporate efficiency Re-adjusting the bunker purchase formula and charter prices of a vessel to reflect efficiency Ports and shippers to incorporate strategies that move energy-efficient ships
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> 50% of top 20 ports to have established programs that incorporate energy efficiency Engaging shippers/charterers that will commit to a "charter" that sees them use more efficient ships and target consumer facing companies first A new clean tech finance model that negates large "up front" ship-owner capital expenditures
Climate Wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> Economic and environmental benefits for carriers and shippers Clean tech company with a wider take Clean tech investors Efficiency-focused shipyards Shippers (less fuel bill)
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> Carbon becomes part of key decision-making process Energy efficiency becomes a competitive advantage The archetypical "shipbroker," who doesn't care about the environment improves the vessel's efficiency to sell the ship and make money
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> Innovators NGOs Carbon War Room Large shippers (pull effect)
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> Ports (incentivize cleaner ships) Cargo owners (push shipyards for more complicity on clean tech innovation) Clean techs Financiers (VC's, banks etc) (understanding shipping's opportunity and invest!)

Strategy: Speed up the process for industries and markets to meet those opportunities	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> Continually learn and update criteria of identifying unique opportunities within shipping and freight through stakeholder engagement and working from within the sectors Continually learn and update methodology for assessing opportunities Continue to engage with key constituencies around opportunities
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> Criteria and methodology defined and introduced to market Opportunities identified Opportunities exploited by constituents (i.e.: Maersk, Cargill) Capital and entrepreneurial activity flows to opportunity space Demonstration of profits
Climate Wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> This provides an incubator for new ideas, processes and tools Can give birth to the dramatic changes that need to happen to over the long term The creation of a clean marine tech market that reflects the 40-50% of opportunity on the left-hand side of the McKinsey / DNV cost curves
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> Opportunities are visible and compelling to the market Early markets are an intermediary for successful proliferation Proving ground is a catalyst for expansion and the “pull” effect Clear diffusion path to the broader market
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> NGO for Methodologies/Universities for Theory CWR Provides Network Innovator carriers, shipper and shipyards API Customer focused Industry Assns Retail Associations
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> Universities Other NGOs Challenged Industries Multi Modal Freight Industry Capital Investors

Strategy: Data and Tools	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Standards – global and national weighting • Baseline data • Proliferation of indices and benchmark tools • Education and training upstream and downstream, and incentivizing adoption • Data collection and best practices
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Achieving a critical mass of adoption of data and tools • Implementing at various levels and sub-sectors (individual companies, ports, routes, intermodal) • Critical mass of shippers, carriers, ports, yards and shipbrokers incorporating efficiency into key decision-making processes
Climate Wealth <i>What is the wealth creation opportunity this strategy will create or stimulate?</i>	<ul style="list-style-type: none"> • Early adopters will have improved bottom line – profit motive • Monetization of improved environmental stewardship • \$70 billion saved in “wasted” fuel bills • Clean tech market that previously didn't exist
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Key threads of operational activity is adopted and measured • Business realizes a financial benefit • Ramping up of percentage of adopted technologies • Financial profitability is up while carbon emissions are down
Leaders <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • World Resource Institute • Carbon War Room • Carriers (especially owners/operators who feel the “fuel pinch”) • Shippers (who pay for 70% of shipping's quarter trillion fuel bill (2011)) • Ports (wider socio-environment gains)
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • North American Council for Freight Efficiency (NACFE) • American Trucking Association (ATA) • Researchers (shipping's contribution to black carbon, for example) • Industry leaders / innovators (pulling through other carriers) • Banks (seizing the good ROI potential) • “On side” associations (pulling members) • Other NGO's (Incl. CWR, NRDC, EDF) – ports and shippers engagement

Working Track: Sustainable Agriculture

Sustainable Agriculture | Overview

Traditional agriculture contributes 10 to 12% of the world's greenhouse gas emissions (GHG). More than two-thirds of these emissions come from two sources: soil management (38%) and animal digestion (32%). There are many opportunities for gigaton carbon emission reductions in agriculture through a variety of strategies and approaches. The ultimate aim is to find the proper balance between needs to feed the growing population with needs for protecting the environment for future generations through sustainable agricultural production practices that are more economical than traditional practices.

There are thus three primary targets for achieving gigaton carbon emission reductions through sustainable agriculture:

- Reducing emissions from animal production
- Decreasing fossil inputs in agriculture
- Scaling new technologies for a diverse set of agricultural markets

Participants

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Barriers to Creating Climate Wealth | Sustainable Agriculture

There are of technical, economic, and policy barriers to achieving gigaton scale GHG reductions through reductions in fossil fuel inputs in agriculture. One of the most significant is access to capital for farmers to invest in alternatives. Many of the alternatives to fossil sources involve new technologies, tools, and techniques about which there is less information for the financial community to evaluate when assessing the profitability of investments. This means that there are higher financial risks for such investments which usually mean higher costs of capital for farmers interested in non-fossil alternatives for fertilizers and use of fossil fuels. Another barrier is the lack of understanding on the part of farmers in the costs and benefit streams, from a cash flow perspective, of non-fossil alternatives. This stems from a lack of standards and metrics for measuring the cost and benefit streams which are often less well defined than those associated with traditional farming processes.

Key Solutions | Sustainable Agriculture

The group identified several strategies to address these barriers. One approach involves developing information and a targeted campaign for lenders to explore possibilities for lending mechanisms and insurance products that are geared for sustainable farming practices in general and reductions in fossil inputs in particular. Effort is needed to monetize revenue streams from organic practices such as converting waste streams to substitute for fossil inputs for fertilizer through techniques such as composting, obtaining carbon credits through existing carbon markets where they are available and farm-based biogeneration of electricity that could be used on-site and excess could be sold back into the grid. Other opportunities include developing financial incentives or policies to encourage farmers to grow cover crops or implementing techniques to increase soil retention of nutrients and water, both of which help control the amounts of fossil-based fertilizers that are needed.

Action Planning | Sustainable Agriculture

In the final session, participants identified the highest priority solutions for the group, including the Carbon War Room and its partners, to pursue after the workshop. First is to work with retail food marketers to apply a new label to food products that would provide consumers with information on the GHG content of the food they eat. This label would take life-cycle uses into account from fertilizers to transport. This step would help create market demand for sustainable products in those instances where the products are cost competitive or where consumer choices are influenced by environmental impacts.

A second step involves encouraging intensified grazing of livestock on grassland. This step encourages more sustainable land management practices and substitution of grasses for energy-intensive feeds such as corn and soybeans.

A third step involves strategies for increasing the use of animal wastes as substitutes for fossil inputs for both fertilizers and energy. This step involves revenue streams that can be monetized for profitable business cases. A fourth step involves finding new partnerships for scaling technologies for sustainable agriculture. This involves building coalitions among technology developers, farmers, policy makers, and the financial community to accelerate development, expand applications, and increase deployments, particularly to smaller farms, less developed countries, and countries with economies in transition.

Strategy: Apply a new label to food products that would provide consumers with information on the GHG content of the food they eat. The intention is to create an industry-wide method of evaluating and labeling data measurement and the GHG content of food products. Labels would take into account a life-cycle analysis of GHG emissions from fertilizers to production and transport.

Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Collect data to develop metrics • Encourage stores to do GHG index from their vendors • Accelerate the momentum of stores like Walmart who are already trying to do this
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Establish clear industry standards and metrics • Obtain institutional signoff from key members of industry value chain including: Federal, State, and City governments, agriculture companies, financial institutions, and non-profits
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Identify key stakeholders • Determine what each stakeholder needs for satisfaction • Assess inventory of current M&V protocols (AFOLU methodologies, etc) • Create regular roundtable working group • Go to annual shareholder meetings to apply pressure • Group signoff on standards • Institutional signoff • Promotion by leaders of industry • Create market demand for sustainable products in those instances where the products are cost competitive or where consumer choices are influenced by environmental impacts
Partners <i>Who else should be involved? What should they do?</i>	<p>Government agencies such as USDA, Department of Commerce. Consumer affairs groups in other countries. Walmart (has done previous work in product labeling with GHG emissions). NGO's such as WWF and Nature Conservancy (similar labeling and certification has been developed for palm oil production in the roundtable for sustainable palm oil)</p>

Strategy: Encouraging intensified grazing of livestock on grassland to reduce animal emissions and land-use change. This step encourages more sustainable land management practices such as the planting of grasses with less cellulose content, active paddock management using fencing systems to allow rangelands to periodically recover from grazing disturbance, and cross breeding of cattle with faster growing species that emit less CH₄.

<p>Operational Pathway What are the major tasks, phases, or steps that form the operational pathway for this strategy?</p>	<ul style="list-style-type: none"> • Identify and convene all relevant stakeholders such as large scale slaughterhouses, purchasers of leather and beef, and NGO's for enforcement of zero deforestation • Develop training programs for small family farms and fattening farms • Secure private and public financing • Develop financing mechanisms and conduits for funding • Develop partnerships with watchdog groups such as Greenpeace to monitor and notify of non compliance • Develop REDD mechanism and incentives
<p>Milestones What 2-4 milestones can we use to measure progress along the operational pathway?</p>	<ul style="list-style-type: none"> • Reduce annual deforestation from land use change caused by cattle expansion in developing countries • Reduce emissions associated with animal production on open grazed lands
<p>Allocation of Capital Where will the funding come from?</p>	<ul style="list-style-type: none"> • Private and public funding. • Convene roundtable discussions of potential private investors • Engage public funding agencies such as national banks (BNDES and World Bank)
<p>Keys to Victory What factors will determine success? How will we know when we are winning?</p>	<ul style="list-style-type: none"> • Monitor national GHG emissions from livestock grazing and show reductions • Monitor land use change such as deforestation and show reductions as a result of implementation
<p>Partners Who else should be involved? What should they do?</p>	<ul style="list-style-type: none"> • National Wildlife Federation (NWF) • Embrapa (Brazil's agricultural research agency) • JBS, Marfrig, and Minerva (Brazilian slaughterhouses) • Amigos da Terra (on the ground) • WWF Brazil (Workshops w/ ranchers) • Alianca da Terra (Looking at intensification) • Instituto Centro de Vida • Greenpeace Brazil (Monitoring, Industry pressure) • Center for International Forestry Research (CIFOR)

Strategy: Scaling new technologies for a diverse set of agricultural markets	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Inventory technologies for commercial applications (demos) • Best opportunity: integrate technologies geospatial mapping / weather data / guidance / yield monitoring / NPK / precision input applications • Next best: soil carbon enhancement (C sequestration) • Package for Investment • Showcase for Investors • Identify mid-level companies / investors • Develop business plan presentations • Organize trade shows (lists exist)
Milestones <i>What 2-4 milestones can we use to measure progress along the operational pathway?</i>	<ul style="list-style-type: none"> • Test company integrates existing technologies • 2nd Company (or more) to do C enhancement <p>Note: there will be more than 2 (likely half a dozen to start)</p>
Keys to Victory <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Company leadership results in competitors changing practices • Market ecosystem needs map for how to get to megaton (CCW help?)
Partners <i>Who else should be involved? What should they do?</i>	<ul style="list-style-type: none"> • Zedex • Field to Market • American Sustainable Business Council (policy side) • William James Foundation

Aviation and Renewable Fuels | Overview

The aviation sector is responsible for approximately 2 percent of annual anthropogenic CO₂ emissions. The industry is highly vulnerable to fuel price fluctuations with fuel representing 20-60 percent of direct operating costs. Industry efforts to increase airline efficiency and lower fuel costs are helping to offset emissions growth. Planes today are on average 20 percent more efficient than the previous generation of planes, and increased use of lightweight materials and continued innovation in design will further improve efficiency. Improved air traffic management technologies could also produce significant fuel savings. Fuel savings in the range of 10 percent have been achieved in early test flights and by early adopters of these technologies. Yet, while these advances are impressive, demand has been growing so rapidly that it is currently outpacing efficiency improvements, resulting in net emission increases.

Low carbon fuels have become a key priority for the industry and will be essential to meeting their emissions reduction targets in the medium term.

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Barriers to Creating Climate Wealth | Aviation and Renewable Fuels

The working track group discussion started with an initial review of barriers to the use of renewable fuels in aviation. The discussion resulted in a prioritized list of barriers, listed in order of perceived importance to the working track group:

- Lack of reflection of “true cost” of petroleum-based fuels
- Lack of long term advanced market commitments
- Lack of project finance
- Feedstock supply, transport, and high feedstock prices
- Rigidness of existing technology infrastructure
- Volatility of oil prices
- Lack of harmonization of metrics/methodologies for renewable fuels GHG LCA across markets
- Lack of recognition for early action
- Infrastructure scalability issues
- Inertia and pushback of “business as usual” practices
- Lack of clarity for aviation fuel insurance (i.e., who insures the fuels and when?)
- Lack of commodity hedging tools

The top identified barrier reflected a concern by the group that renewable would not be able to compete with traditional petroleum-based fuels without first leveling the playing field between the fuels (e.g., eliminating petroleum subsidies that distort the market and taking the cost of carbon emissions into account). However, the dominant theme was the lack of financing mechanisms and long-term contracts, which directly impacts market penetration.

Key Solutions | Aviation and Renewable Fuels

To mitigate these barriers, a number of solutions were considered before the group focused on several consensus “impact” solutions. One impact solution that received considerable discussion was an aviation fuel Decision Support Tool (DST) developed by staff at the Carbon War Room. The DST was developed to help provide stakeholders (i.e., fuel buyers, investors, and renewable fuel companies) with more transparent and accurate information in order to accelerate the formation of the low carbon aviation fuel market. As such, the DST is being developed to provide key metrics needed to be able to compare firms across the supply chain. These metrics include feedstock type, products, capacity and production data, prices, development stage, and role in supply chain and compliance status. The desired result of this improved market information would be to accelerate renewable fuels industry formation through increased investment, successful partnerships across the value chain, and better use of government funds.

The development of a public/private consortium to finance development of cost-competitive & sustainable multi-feedstock markets was a topic of considerable discussion. The establishment of this type of partnership would help reduce and spread overall project risk and demonstrate technology, while also establishing a large, long-term market for low carbon aviation fuels. In addition, the consortium would help ensure access and control over a stable feedstock supply for the market. The stakeholders involved could include the financial community, government (DOD, DOE, etc), industry (commercial or freight aviation), technology solution providers, and agriculture.

Another solution that could potentially serve to jump-start the market is the establishment of a reverse-auction for low carbon aviation fuels. A reverse auction would create a hedge valve through long-term fuel contracting and leverage demand to allow sellers to access capital to build refining capacity, ultimately supporting the nascent market for low carbon aviation fuels. This auction would bring together buyers (e.g., Dept of Navy, commercial airlines, air freight) with sellers in order to create capital markets based on buyers' willingness to buy and sellers' minimum quantity needed to achieve scale.

Creation of a financial instrument in the form of a 25 year low-carbon aviation fuel bond that is near-term performance contingent, but government guaranteed and inflation-protected, may also help advance industry growth. The establishment of this kind of bond would anchor medium-term pricing certainty for producers (albeit on a performance-contingent basis) through the establishment of a government credit enhanced long-term offtake agreement.

The group agreed that the next step would be to identify key interested parties to implement these types of solutions, with CWR acting to convene and curate dialogue. The interested parties would then be able to design a creative finance (e.g., auction, bond, etc) vehicle. After finalizing these consortia, these mechanisms could then be executed.

Working Track: Island Economies

Island Economies

Island economies have special geographic, economic, and resource characteristics that make them excellent targets for net-zero carbon communities. An island economy may be a geographic island; an isolated community, such as a land locked region; or an islanded microgrid used by the military, green communities, or developing countries with unreliable grids. Imported fossil fuels and other resource costs are often 3-4 times higher on islands due to steep transportation costs, and overall energy demand is too small to achieve attractive economies of scale for conventional power production and fuel distribution. Many islands have ample wind, solar, biomass, and hydro resources that can be integrated into sustainable electricity and transportation infrastructures, the two biggest energy demands on most islands. These characteristics create ideal conditions for renewable energy, sustainable food production, energy efficiency, and alternative transportation options. Once established and proven, a sustainable island economy can serve as an economic model for other islands and non-island areas and lead to gigaton-scale carbon reductions.

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Barriers to Creating Climate Wealth | Island Economies

Although Island Economies may present a unique opportunity to serve as a model for other areas, geographic isolation also creates distinct challenges when implementing net-zero carbon technology strategies. For example, supporting infrastructures, skilled labor resources, and certain natural resources such as water may be insufficient to sustain certain renewable options. The strategies must also be aligned with the needs and cultural norms of political leaders, local communities, and citizens of Island Economies. The perceived uncertainties and risks associated with implementing alternative technologies in island communities must be assessed and mitigated. Finally, island economies often lack sufficient scale to drive down project costs and produce attractive returns to investors.

Key Solutions | Island Economies

Samoa is proposed as a model for implementing low-carbon/zero-carbon options in island infrastructures. Samoa has several favorable conditions, including a stable government with supportive national sustainability policies, diesel electricity generators that require replacement, no incumbent fossil fuel suppliers, legislation that permits independent power producers and abundant natural resources. There are about 11,000 vehicles on Samoa and bio-based fuels can be grown on the island provided there are favorable economics and a strong and sustainable value proposition for the local communities. Shorter travel distances also makes electric vehicles viable. In addition to electricity and transportation sectors, tourism presents a cross-cutting opportunity as an early market mover for both sectors.

Action Planning | Island Economies

Several ideas were developed and discussed for how to implement low-carbon solutions on the island of Samoa as a test case for greater implementation. The group concluded that there is an opportunity to replace diesel with alternative fuels. It was also suggested that private industry could potentially either purchase the Electric Power Corporation or form a joint venture with the entity in order to reduce dependence on fossil fuels by increasing the use of alternative fuels and also improve energy efficiency. The group also identified several steps they viewed as necessary to move towards a greater use of renewable fuels for transportation.

Strategy: Private sector buyout/JV with the electric production corporation in Samoa coupled with a transition to fully sustainable, net-zero carbon power production	
Key Features <i>What does this plan entail?</i>	<ul style="list-style-type: none"> • Samoa government will own all power assets • Provides public-private partnership solution • New legislation brings a regulator to set tariff and look out for consumers • Brings needed expertise and technology advances • Need early wins to build trust
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Obtain senior political buy in • Conduct full technical and economic analysis • Prepare good finance plan • Conduct due diligence – where to locate, capacity, site control, legal analysis • Develop and issue international tender <ul style="list-style-type: none"> ◦ Include renewable portfolio obligation (RPO) • Get development bank to offer concession loans, Samoa govt, private entity • Conduct education programs and community engagement
Key Questions to Address <i>What questions must be answered to move along the operational pathway?</i>	<ul style="list-style-type: none"> • Are there any purchase contracts in place that would prohibit big shifts or changes? • What are regulatory barriers to profitable operation? • Should it be generation and transmission? • Will the contract allow for interconnection or capacity to be shared? • Would it be easier, more expeditious, and more cost effective to bring in consultants to improve the existing utility on a contract basis? • How best to manage engagement with communities?
Key Challenges, Barriers, Risks <i>What unique challenges does this pathway face?</i>	<ul style="list-style-type: none"> • Theft of electricity • Developing full island solutions • Managing the engagement • Inherent legacy issues of the utility • Workforce issues – how trained is workforce? How long to get the workforce up to speed? • Efficiency can be more profitable than delivering energy. Can the utility provide efficiency? • Samoa wants tried and true technology. Don't want to be a proving ground. • Willingness of people to pay
Data Requirements <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Cost-integrated resource plan • Current valuation of utility • Cost of generation • Least cost analysis • Revenue estimate • Willingness/ability of customers to pay • Inventory of assets/liabilities • Complete financial analysis including current and expected profitability • Historical sales data • Penetration rate of the utility and growth forecasts
Leaders and Partners <i>Who should lead this effort? What should their focus be?</i>	<ul style="list-style-type: none"> • Samoan government leaders • Contracted entity • Development banks • Community and tribal leaders

Strategy: Transition transportation infrastructure to bio-based fuels	
Operational Pathway <i>What are the major tasks, phases, or steps that form the operational pathway for this strategy?</i>	<ul style="list-style-type: none"> • Shared savings with stakeholders • New agricultural opportunities to create wealth for communities • Address supply and demand simultaneously • Biorefineries to produce renewable fuels and byproducts
Key Questions to Address <i>What questions must be answered to move along the operational pathway?</i>	<ul style="list-style-type: none"> • Which vehicle engine technology to use? • Vehicle data available? What are vehicles being used for in Samoa? • Status of the road and fuel infrastructure? • Is it a sustainable endeavor? Is there sufficient bio feed stock? What is the reliability of having coconut oil forever? Are you going to produce bio-diesel or use coconut oil? Converting to biodiesel will add costs. • Where will funding come from? • Regulatory, incentive, infrastructure? • How many liters can be produced in current situation? [188 million total existing, 88 million coconuts were available to produce biodiesel – from those 88 coconuts projected 11.54 million liters (25% of current transportation need). Small scale competition for coconut as food.] • Will the local communities buy in to agriculture production? Will we need to set prices and initiate long term contract to guarantee an income? • Do we have confidence that this would be a lower cost perspective?
Key Challenges, Barriers, Risks <i>What unique challenges does this pathway face?</i>	<ul style="list-style-type: none"> • Warranty on cars • Vehicle availability and cost • Renewable fuel production cost/supply/infrastructure • Funding • Sustainable of supply • Political policy and customs
Data Requirements <i>What factors will determine success? How will we know when we are winning?</i>	<ul style="list-style-type: none"> • Vehicle size • Average miles per hour • Average miles driven • Regulatory landscape • Aggregated activity potential tourism capacity to support • Funding sources • Estimate of demand

These strategies, and additional options for electricity and tourism, must be integrated into a fully-costed Low Carbon Development Plan (LCDP) for Samoa (Samoa Roadmap). Considering all strategies, the Samoa Roadmap will need to address the following barriers, success factors, and strategies.

Key Barriers to Implementation

- Government and community concerns
- Management time & cost of evaluating project potential for top tier energy and finance companies
- Uncertainty, risk, and lack of scale

Keys to Success

- Early senior political engagement and extensive community consultation
- Deliver a fully-costed Roadmap/Low Carbon Development Plan for Samoa
- Create a prototype example with a compelling business case, which includes a scale-up strategy, with all risks mitigated

Innovative Roadmap Strategies

- Provide an expert team to bridge the gap between top tier energy and finance companies and the Island Economy
- Design a project in Samoa that is easily scalable
- Develop a portfolio of projects and finance them
- Construct a web-based Island Economy Blueprint to smooth transition off fossil fuels

To achieve gigaton scale carbon reductions, the Samoa model must be carefully monitored, successful, fully documented, and tweaked for other island economies. The true benefits of these strategies will not be realized without successful scale-up that takes advantage of lessons learned from the Samoan experience and leverages economies of scale to drive down technology and project costs while increasing margins that will attract additional investment.

Creating Climate Wealth | Call to Action

The Carbon War Room and its partners determined that the topics outlined in this report are critical pieces of the puzzle that require immediate attention and collective understanding in order to achieve gigaton-scale carbon abatement across all sectors of the economy by 2020.

Only through the shared commitment of stakeholders from around the world will we achieve the growth rates in cleantech and renewable energy that will enable the clean economy. The Climate Wealth Summit, and in particular the results produced by the participating working groups, is an important first step. However, the real measure of success will be the actions that we take going forward. Stakeholders must work collectively, taking the initiative to contribute their time, unique expertise, and resources to change the status quo as a whole. The Carbon War Room is looking forward to working with all of you on this crucial task.

About The Carbon War Room

Carbon War Room works on breaking down market barriers for capital to flow to entrepreneurial solutions to climate change, by employing a sector-based approach focusing on the solutions that make economic sense right now. We target the movement of institutional capital into a working marketplace and the elimination of market inefficiencies (in the form of insufficient information and high transaction costs, among others). Policy and technology are necessary conditions to the solution; however, they are neither sufficient, nor the bottleneck to progress.

Our vision is to see markets functioning properly, and clean technology successfully scaling to promote climate wealth, business and economic growth. In the role of a climate wealth catalyst, Carbon War Room focuses on areas where a sector-by-sector approach to climate change can be applied to generate gigaton-scale carbon savings. We seek to complement existing efforts and organizations, leveraging our convening power, our market-driven solutions-oriented focus, and our powerful global network to develop and implement these solutions.



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Creating Climate Wealth Post Conference Report

ACCELERATING THE DEPLOYMENT OF CLEANTECH SOLUTIONS



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