



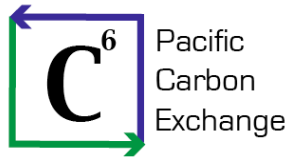
## **Creating a California Energy Efficiency Market: An Energy Efficiency Credits (EEC) Protocol in California**

### *Introduction*

Despite the importance of the AECO (architecture, engineering, and construction) sector in achieving deep cuts in greenhouse gas emissions both rapidly and cost-effectively, this “potential” remains just that – and emerging carbon markets have failed thus far to catalyze large-scale investment in building energy efficiency.

The Pacific Carbon Exchange is working toward the creation of an Energy Efficiency Credit (EEC) market, which would be applicable to an expanded California Renewable Portfolio Standard (RPS) that would allow utilities to meet part of their RPS obligations by purchasing EECs earned by building owner/operators, developers and buildings service providers through their investment in building energy efficiency technologies. By lowering energy consumption in buildings below a given baseline determined by building energy consumption models for new construction and major retrofits, owner/operators can earn EECs (one EEC = 1 Mwh saved). Utilities will have the opportunity to purchase these credits, as they do renewable energy credits (RECs), and apply them against the expanded RPS. Set-asides of allowance allocations are required to prevent double-counting of the related energy savings / emission reductions under capped sectors. This energy efficiency credit market system will create hundreds of thousands of green construction jobs in the moribund construction industry in California, as well as reduce GHG emissions by as much as 40% in some building sectors. It would be applicable nationwide, and the proposed quantification methodology is being developed for international application under the UN Clean Development Mechanism.

Based on an existing computer modeling platform widely accepted in the AECO sector for quantifying building energy modeling under California Title 24, this market model will create a basis for calculating *additional* energy-efficiency gains in building energy performance above business-as-usual efficiencies integrated into building designs under current California building codes. AECO service providers will be incentivized to create new business models around revenue streams generated by the trading of EECs rendered by the installation of energy-efficiency technologies into existing buildings and new building construction. These new business models will substantially lower capital costs to owner/operators and developers, creating a wave of building energy-efficiency technology investment and new green construction jobs never before seen in the AECO sector.



### *Argument for an Energy-Efficiency Credit Market*

It is a common misconception that transportation is the single largest energy-consuming sector of the economy, however this is incorrect. Indeed planes, trains and automobiles do account for a huge percentage of America's energy consumption (37%), but the single largest consumer of energy in the US, at nearly *half* (48%) according to the US Department of Energy, is buildings. Through lighting, heating, cooling, plumbing, communications, and security buildings represent the front-line of this hugely complicated effort to address energy consumption and global climate change.

As has been shown in an analysis of abatement factors published by McKinsey & Co. in 2008, an overwhelming percentage of low cost, high impact emissions abatement opportunities are through the investment in building energy efficiency technologies. Up to now, these investments have been slow to pervade the AECO (Architecture, Engineering, Construction) industry due to poor communication of the ROI benefits associated with making these capital investments during initial construction or major renovation. Owner/operators and developers also have been reticent to pay the premium required to install these systems without seeing significant returns on their investments at payback periods that fit their business and profit models. Finally, governing bodies, both local, state and federal, have not offered meaningful enough incentives on both the supply and demand sides of this equation to spur these investments.

PCarbX will propose to the public and private sides of this critical partnership a solution through the environmental trading markets. John Doerr, acclaimed investor from the venerable Kleiner-Perkins Venture Group in Silicon Valley, has been quoted as saying that comprehensive cap-and-trade legislation in the US Congress would result in the greatest wave of technology investment in the US since the dawn of computing.

We believe that an energy-efficiency credit market will create one of these waves in the AECO sector, creating hundreds of thousands of green construction jobs, billions of dollars of energy-efficiency technology investment, thousands of new companies, and many billions in wealth generation in the State of California through energy-efficiency innovation. California would also once again assume leadership in creating highly innovative, highly effective new approaches to solving the single greatest challenge of this generation – global climate change.



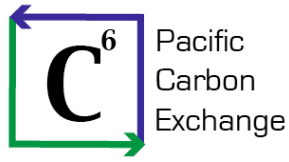
## *Energy Efficiency Credits and the Function of an EEC Market*

### Energy Efficiency Credits

It has been widely acknowledged that hitting the CA RPS target of 33% by 2020 will be difficult to achieve through renewables generation alone. That is why California must create new policy initiatives to address the demand side of the RPS equation. The creation of an Energy Efficiency Credit (EEC) market, a sister credit to the REC, which would be applicable to the expanded California RPS, is just such an initiative. This EEC credits system would allow utilities to meet part of their RPS obligations by purchasing EECs earned by building owner/operators, developers and buildings service providers through their investment in building energy efficiency technologies. By lowering energy consumption in buildings below a given baseline determined by building energy consumption models for new construction and major retrofits, owner/operators can earn EECs (one EEC = 1 Mwh saved). Utilities will have the opportunity to purchase these credits, as they do renewable energy credits (RECs), and apply them against the expanded RPS.

Energy Efficiency Credits (EECs) are a financial instrument comparable to Renewable Energy Credits (RECs). In the case of new construction, an EEC is created by the delta between the Title 24 baseline for a target building project and the lower energy output achieved by the installation of energy-efficiency technologies in the new building project. In the case of existing building retrofits, EECs would be issues for the delta between an existing building's last three years of utilities consumption and its consumption after the installation of energy efficiency technologies. That delta is measured in terms of megawatt-hours (mWh) of energy saved; each mWh mitigated below the baseline renders a single energy-efficiency credit (1 mWh = 1 EEC). Each building project will have a crediting period, the duration of which the building or retrofit will generate credits through its actual energy efficiency performance ex-ante. The crediting periods will be dependent on a number of criteria tied to aggregate value of energy efficiency measures installed within the building, and can last from 5-10 years. This means a newly constructed building including extensive energy efficiency technology features such as efficient lighting systems, HVAC, co-generation, low-carbon materials, etc. saving 687,000 kWh/year might generate 687 EECs each year for 10 years post-occupancy. These credits, once earned, could then be traded on open environmental commodities markets.

Set-asides of initial allowance allocations will be required to prevent double-counting of the related energy savings/emission reductions under capped sectors. This energy efficiency credit market system will create hundreds of thousands of green construction jobs in the



moribund construction industry in California, as well as reduce GHG emissions by as much as 40% in some building sectors. It would be applicable nationwide and make California and the western region a clear leader and innovator in GHG emissions reductions policy.

The AEEO industry sector would have substantial incentives along the supply chain of design, engineering, construction, and building services to create new business models incorporating an EEC market into their revenue projections and service models. AEEO service providers (ASPs) would be able to approach building owner-operators and real-estate developers with the proposition of construction and retrofitting of buildings with energy efficiency technologies at low to no cost to the owner/developer. ASPs would be able to build their revenue and compensation models on the stream of EECs that would be rendered by the project. These EECs might potentially be more valuable to ASPs than current direct cost models that are heavily negotiated by owner/developers at the front end of building/retrofit projects. Cost has classically been the principal impediment to incorporating energy efficiency technologies in buildings due to their long payback periods and difficulty in determining return on investment. Tradable EEC markets would remove that cost pressure from the owner/developer and incent ASPs to evolve their business models.

#### Measurement, Verification, & Certification

Measurement, verification and certification will be critically important factors to creating a robust market in energy efficiency where the quality and veracity of credits must stand to the most rigorous standards. Therefore a framework, much like the framework established to verify and certify carbon offset projects and resulting credits must be established.

This regulations for the establishment of this market framework will likely be established, in the State of California, by the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC). This regulatory framework will also likely include the creation of an organization that will verify and certify construction projects for the creation of energy efficiency credits like the California NGO, Climate Action Reserve (CAR), and its carbon offset registry. This organization will establish the necessary protocols based on the eQuest building energy performance models discussed above to verify and certify new construction and building retrofit projects as eligible to render EECs for trade on environmental markets.

Credits themselves would likely carry the following attributes:

- Title to credits would be granted to the owner of the building project



- Projects would need to be completed by the start date of the EEC market
- Range may need to be set on credit prices
- Credits will have individual serial numbers and vintages
- Certification and verification required to generate credits
- Credits will not expire and may be banked
- Project technology types will include, but not necessarily be limited to lighting, HVAC systems, building envelope, energy co-generation, building management solutions, water management solutions, building integrated renewables.
- Purchase and trading of EECs will be open to general market interests and not limited to any specific player or industry sector

Certified credits would be issued individual serial numbers, much as carbon reduction tons (CRTs) are issued serial numbers in the CAR system, then customer accounts would be credited with those serialized EECs to a registry – in the case of EECs we recommend that they be tracked by the Western Renewable Energy Generation Information System (WREGIS), the same registry which currently tracks renewable energy credits (RECs) in the West.

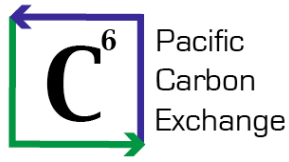
The registry becomes a key organization to the legitimizing of credits in the market and the key information clearing-house as to where credits are along their life cycle. The registry tracks the credit from the project phase, through verification and issuance, through trading between counter-parties, and finally retirement when credits are submitted for compliance to the Air Resource Board and/or the PUC.



### Comparable Programs

There are comparative energy efficiency market models working in the European Union (UK, Italy and France) and in the United States. Here in the US, “White Tags” are currently being traded in Connecticut, Pennsylvania, and Nevada against each of these state’s individual renewable portfolio standards.

The most significant difference between the White Tags system in these states and the energy



efficiency market we are proposing here is how these credits are issued and traded. White tags are essentially equivalent to the EEC, measured as 1 mWh/ credit, but are measured as energy not generated *at the facility*, rather than energy saved through energy efficiency technologies at individual buildings. Utilities in the white tags markets are required to purchase a minimum percentage of credits to meet the energy-efficiency portion of their renewable portfolio standard – for example, Connecticut utilities must meet 3% of their RPS in 2009 through white tags, 4% in 2010. The market in CT is limited to utilities trading between each other, and the certificates themselves are limited by a one-year shelf life.

The white tag model puts ultimate responsibility on the utility sector to meet the energy efficiency percentage requirement without adequately incenting the private sector and AECO industry to make the huge scale energy efficiency technology investments needed to substantively mitigate GHG emissions through energy efficiency in buildings. This difference is key – in order to create a market of sufficient scale to adequately affect real reductions in energy usage by hundreds of thousands of buildings in California, market incentives to utilize EECs as a revenue generator and cost-reducer must be openly available, as should the market be openly available to all who might want to participate.

For More Information about the Pacific Carbon Exchange or energy efficiency credit markets in California and beyond, please contact Aaron Singer at [aaron@pcarbx.com](mailto:aaron@pcarbx.com) or Brett Goldstein at [brett@pcarbx.com](mailto:brett@pcarbx.com).