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White certificate trading: A dying concept or just making its debut? Part II: Challenges to trading white certificates

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ABSTRACT

This article addresses the major challenges to trading white certificates, identify why these obstacles exist, and how successful white certificate markets have addressed these potential problems. Among the challenges are defining a white certificate (including whether it meets the standard of being real, additional, permanent, verifiable, and enforceable) and identifying who owns them and how they are tracked.

1. Introduction

This article is the second in a series of three articles on energy-savings certificates, which are commonly referred to as white certificates. The first article addressed the current status of white certificates markets worldwide. This article addresses the major challenges to trading white certificates, identifies why these obstacles exist, and then discusses how successful white certificate markets have addressed these potential problems. The third article in this series will address the future potential markets for these white certificates within the U.S. The challenges that face white certificate markets are similar to those that have plagued offset and renewable energy certificate (REC) markets, and connections to these markets and lessons learned will be highlighted where appropriate. Also, how these challenges have been approached by certain countries will be described.[1] The challenges that will be addressed include the definition of a white certificate (including whether it is real, additional, permanent, verifiable, and enforceable), who owns the certificates, and how they are tracked.

One of the first major challenges to white certificates is the definition, which varies by technology and unit, based on where it originates. Inconsistency in this definition prevents widespread trading. Adding to this situation, the certificates must be real, additional, permanent, verifiable, and enforceable to be considered valid. The "real" requirement is challenging when these programs have overlapping greenhouse gas legislation. Similar to this "real" requirement, the certificates must also be considered "additional," which involves assuring that the white certificate program is not incentivizing projects that would have occurred in a business-as-usual situation. The criterion of being "permanent" is difficult as the permanence of these white certificates varies by technology, and the number of years credited to particular white certificates is dramatically different based on the program where it exists. Through proper monitoring and verification, each program ensures that the white certificates are verifiable and enforceable, and these programs differ greatly based on their location. Each white certificate must have an ownership trail and be tracked effectively, but ownership gets muddled based on who paid for the equipment upgrade. Furthermore, the tracking systems are not always transparent or open to the public, making trades hard to follow. How each market handles these challenges will be illuminated in the section below.

2. Definition of white certificates

One major issue facing the establishment of a white certificate market in the U.S. or globally is the fact that there is not one singular, clear definition. Even the name of this instrument differs by state and country, as they have been named under different pieces of legislation. Table 1 shows examples of how the definition varies worldwide.

Not only do the units for white certificates differ, but the types of technologies that are acceptable for generation of white certificates differ by program location. The lack of a common unit and definition prevents these fledgling programs from ever being fungible internationally as occurs within the EU Emission Trading Scheme. One of the

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[1] Given the relative newness of these markets, it is not possible to describe how each market has approached each challenge. Therefore, the analysis will not describe every country's program in each of this article's sections.

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Table 1
White certificate definition and name by location.

Location	Name	Definition
Connecticut	Type III REC or Conservation Certificate	One MWh of electricity saved from one of the following: "(1) customer-sided CHP systems, with a minimum operating efficiency of 50%, installed at commercial or industrial facilities in Connecticut on or after January 1, 2006; (2) electricity savings from conservation and load management programs that started on or after January 1, 2006, and (3) systems that recover waste heat or pressure from commercial and industrial processes installed on or after April 1, 2007." (DSIRE, 2017)
Nevada	Portfolio Energy Credits	One kWh of electricity "(1) implemented after January 1, 2005; (2) sited or implemented at a retail customer's location; and (3) partially or fully subsidized by the electric utility. The measure must also reduce the customer's energy demand (as opposed to shifting demand to off-peak hours)" (DSIRE, 2016).
Pennsylvania	Tier II RECs	One MWh from (new and existing) waste coal, distributed generation, demand-side management, large-scale hydro, municipal solid waste, wood pulping and manufacturing byproducts, useful thermal energy, and integrated gasification combined cycle coal technology (DSIRE, 2018).
Sterling Planet Clients	White Tags®	One MWh of electricity savings or 1000 cubic feet of natural gas saved (Sterling Planet, n.d.).
Programs Abroad		
Australia - New South Wales	Energy-Saving Certificates	One MWh of electricity saved or 0.39 certificates per MWh or around 0.11 certificates per Gigajoule saved (NSW Government, 2015).
Australia – Victoria	Victorian Energy Efficiency Certificates	One metric ton of CO_2 savings (Essential Services Commission, n.d.).
Denmark	Energy-Saving Certificate	One kWh of energy saved from approved methods in the electricity, natural gas, heating oil products, and district heating sectors (Energi Styrelsen, 2013).
France	White Certificates	One kWh of electricity savings (IEA, 2017).
Italy	White Certificates	One metric ton of oil equivalent (Pela, 2015).
United Kingdom	Energy Efficiency Obligations	One metric ton of CO_2 savings (U.K. Committee on Climate Change, 2016).

biggest benefits of these tradable white certificates is that they allow for cost containment as market participants can trade certificates to meet goals instead of attempt to meet all energy reduction targets on-site; however, cost containment is limited when international programs are not fungible with each other and individual markets have fewer players and opportunities for energy savings.

There has been an effort to create a universal, U.S. definition of a white certificate. Many experts in the field thought that a market for MWh savings would be as popular as a market for MWh generated from renewables, especially after Amory Lovins of the Rocky Mountain Institute had famously coined and promoted the idea of the "negawatt," the watt that was never used (Lovins, 1985). Before RECs gained their popularity in the voluntary market, and were accepted by state legislatures in RPSs, it was necessary for them to be clearly defined. In 1997, Green-e was created from the Center for Resource Solutions to develop a standard for renewable energy certificates (RECs). The Green-e standard specifies the types of technologies that are eligible for certification, the year when the generation facility must have been constructed, the types of eligible customers, and other details of the generation (Center for Resource Solutions, 2017). Both the compliance and voluntary REC markets experienced enormous growth in the early 2000 s, stimulated by the emerging state renewable portfolio standards in the compliance realm and the EPA's acceptance of RECs for their Green Power Partner Program, which allowed schools, non-profits, businesses, and industrial facilities to make voluntary commitments to purchase green power. The general public became aware of RECs as REC marketers sprung up, and they became a popular way to try to reduce one's impact on the environment; many saw them as a way to reduce their carbon footprint. Voluntary markets grew by 500% between 2003 and 2008 (Cook and Karelas, 2009). By 2016, "The voluntary green power market [accounted] for about 28% of all U.S. renewable energy sales" (O'Shaughnessy et al., 2017).

In the early 2000 s, many market observers thought that white certificates would have the same success as RECs. Energy efficiency was seen as something that people within their own territories could achieve on their own. No special resources like excellent wind, solar, hydro, or biomass were needed to implement efficiency measures; therefore, purchasing credits for efficiency measures taken elsewhere was not desirable to customers. Compounding this situation as of December 2017 is that the cost of renewable energy continues to fall, making it close to the price of cheap energy efficiency measures. The American Council for an Energy-Efficient Economy (ACEEE) did not endorse these white certificates, and no major certifying body was interested in creating a standard for them. Green-e considered creating a standard for white certificates; however, unlike RECs where a sale could allow a community-based wind farm to go in the ground, there was no charismatic story associated them. White certificates simply lower the investment threshold to make the technology financially viable (Martin, personal communication, Nov. 8, 2017). The Environmental Resources Trust also began development of a standard (Barbour, personal communication, Nov. 10, 2017). However, no organization followed through with the creation of a standard for white certificates because of difficulties with the public perception of this intangible commodity and challenges related to what is often termed as the "Big 5" in the world of carbon offsets—whether the white certificate is **real, additional, permanent, verifiable, and enforceable** (Gero, 2009). Each of these characteristics will be described in turn.

2.1. Real

Ensuring that a white certificate is real would necessitate that it had not been double-counted, since counting the same reduction twice would not meet greenhouse gas or energy reduction goals. The design of future federal greenhouse gas legislation has a large bearing on whether or not a white certificate is deemed "real." Many critics of policies to promote energy efficiency or credit electricity savings claim that these programs are unnecessary where cap-and-trade schemes exist. The logic of this argument is that the cost of electricity under a cap-and-trade scheme will include the price of carbon, and the market will naturally incentivize technologies that reduce electrical consumption. These critics also claim that white certificates could be double-counted in a territory where electric power producers are responsible for reductions since any use of energy-efficient technology will help either a generator or industrial facility that is capped meet its emissions targets. If the white certificates are sold from this reduction, then this would constitute a case of double-counting (Nadel et al., 2017).

However, others make the counterargument that energy efficiency technologies need more of a direct incentive, especially since some emerging carbon markets like the Regional Greenhouse Gas Initiative (RGGI) have not had the effect of increasing demand for energy-