Kaiser Permanente: Linking Renewable Energy and Healthcare

"Climate change isn't a distant threat. The health impacts of a changing climate can be felt today in the form of increasing rates of asthma and other respiratory ailments, spread of infectious diseases, heat stress, and injuries from severe weather events."

— Kathy Gerwig, Kaiser Permanente environmental stewardship officer[1]

Ramé Hemstreet, vice president for operations and chief sustainable resource officer at Kaiser Permanente, knew the ins and outs of the healthcare organization's resource use better than anyone. He was happy to spearhead the use of renewable energy in the healthcare system and was proud to be part of Kaiser Permanente's efforts to green its operations, an exercise lauded by many in the healthcare and business communities. Over the past few years, the idea of renewable energy had been gaining traction as it aligned with Kaiser Permanente's goal of being a responsible healthcare leader. The fact that fighting climate change could also lead to better community health made the prospect of an investment in renewables even more appealing. However, exactly how Kaiser Permanente was going to achieve success in mitigating climate change was still uncertain.

The drive toward renewables for Kaiser Permanente started serendipitously in 2006 when Jeff Keyak, senior energy consultant, attended a High Performance Building Committee meeting. Toward the end of the meeting, someone asked if a power purchasing agreement (PPA) for solar energy was an option to offload from the capital cost of building operations. Though the committee had not at the time seriously considered the option, Keyak had experience with PPAs, so the suggestion went to the right person.

Hemstreet and Keyak noted several necessary considerations: With Kaiser Permanente's large operation, where would renewables be launched or used? Given that projecting the escalating costs of commercial electricity is more art than science, what was the true cost-benefit that renewables offered and how could this be projected? What sort of PPA or leasing agreement should Kaiser Permanente commit to? How would stakeholders receive the adoption of a new technology at such a scale at all levels?

Hemstreet and Keyak worked tirelessly over the next few years with others at Kaiser Permanente to map out the possible implications of these questions. Along with Don King of Facilities Operations, they worked with Recurrent Energy to install a pilot of 11 megawatts of solar generation capacity.[2] They also joined forces with Kathy Gerwig, vice president of employee safety, health and wellness, and environmental stewardship to develop a policy to reduce absolute greenhouse gas (GHG) emissions by 30% below 2008 levels by 2020 and that would allow regional councils to implement further investments.

Hemstreet was able to take this initial pilot work and create the vision to develop it to scale with his team. He marveled at how far Kaiser Permanente had come and had yet to go. Soon, he would present to the executive board and board of directors on the success of renewables to seek their approval for their biggest such investment yet — a 20-year renewable PPA. If there was anything that his time in the Navy had taught Hemstreet, it was that he needed to be prepared for this meeting. It was time to get to work.

Industry Overview

Healthcare's Role in the Economy

The healthcare industry and its associated costs had been growing at an accelerated rate in the U.S. for the last fifty years. In its infancy, Henry Kaiser's health insurance plan for his shipping business charged a meager $18.25 per year in 1953.[3] By 1960, healthcare costs rose to an annual $147 per person across the U.S.[4] By 2014, this price skyrocketed to $9,523 a year and healthcare as an industry accounted for almost 18% of U.S. GDP; total spending was estimated at $3 trillion (see **Appendix A** for related data).[5] This figure included medical expenses, pharmaceuticals, and insurance payments as well as the operations and maintenance of medical buildings. In premiums alone, the largest 125 U.S. health insurers collected nearly $744 billion in 2013.[6] Furthermore, the U.S. spent more on healthcare annually than Japan, Germany, France, China, the U.K., Italy, Canada, Brazil, Spain, and Australia combined.[7] If the American healthcare industry were a country, it would be the sixth-largest economy on the planet.[8]
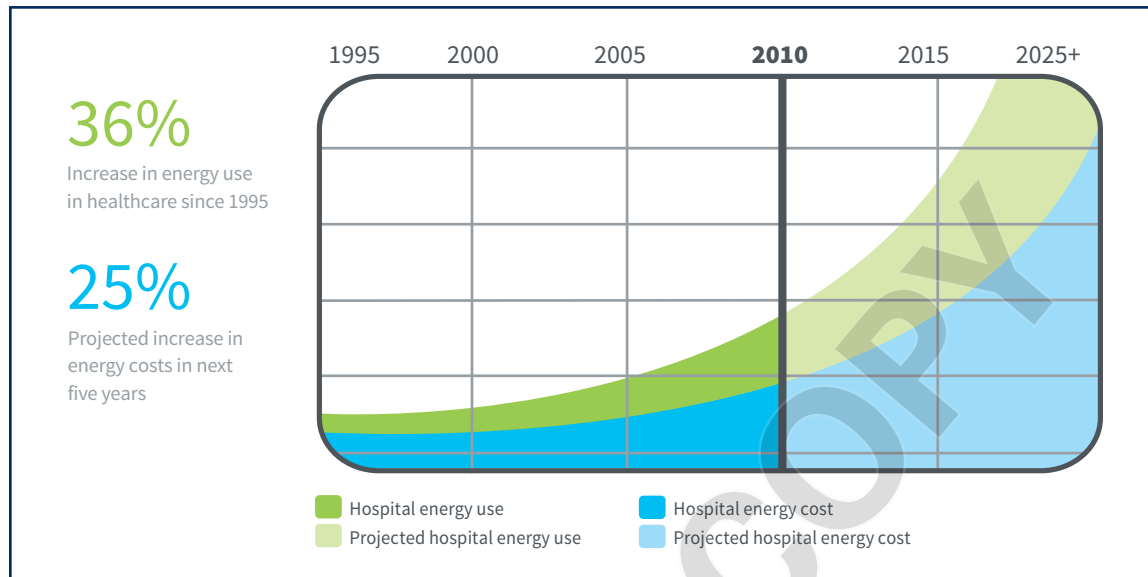
Healthcare's Role in the Environment

The growth in healthcare spending (estimated at 4.9% per year in North America) was caused by increasing pressure to deliver safe, quality care and to promote population health all while controlling costs and reducing waste.[9] However, energy use by healthcare organizations increased 36% since 1995, a trend that was likely to continue. The number of elderly people, for example, was expected to nearly triple to 2 billion by 2050. Increasingly expensive equipment became the norm to improve quality and delivery of care while maintaining patient comfort.[10] While energy use increased, energy costs were projected to rise 25% between 2010 and 2015, putting increased financial pressure on the healthcare industry (see **Exhibit 1**).[11]

The *Journal of the American Medical Association* published a study that concluded that the healthcare sector was responsible for over 8% of the country's total emissions.[12] These factors struck a unique dichotomy within healthcare: These emissions and the sheer volume of waste produced by the healthcare industry created decidedly negative impacts on human health and contributed to climate change.

Numerous studies have examined the extent climate change affects human health both in the context of human lives and monetary investments. The World Health Organization estimated that anthropogenic climate change claimed 150,000 lives annually due to increased weather variability, severe weather events, and direct emissions.[13] Estimated costs related to the top six climate change-related health impacts were projected to total $14 billion per year, with almost all of that value attributed to premature deaths.[14] The direct economic impact on the healthcare system was estimated to be $740 million, with 760,000 additional

interactions between patients and the healthcare system.[15] Climate change therefore places an enormous burden on healthcare, creating a positive feedback loop of increased health needs and environmental impact.

Exhibit 1
Projections for Energy Use and Costs in the Healthcare Sector

36%
Increase in energy use in healthcare since 1995

25%
Projected increase in energy costs in next five years

| 1995 | 2000 | 2005 | **2010** | 2015 | 2025+ |

Legend:
- Hospital energy use
- Projected hospital energy use
- Hospital energy cost
- Projected hospital energy cost

Source: Schneider Electric. "How to Improve Your Hospital's Financial Health." 2011. Accessed 14 Jan. 2016. <http://www.schneider-electric.com/solutions/ww/en/med/4662732/application/pdf/1312_1172-998-4483_gma_lowres.pdf>.

Company History

Kaiser Permanente: Humble Beginnings

Henry J. Kaiser began his career paving roads. Under the Federal Aid Road Act of 1916, he pioneered government-funded projects in much of the then-undeveloped Pacific Northwest, eventually progressing to major engineering projects including the Hoover Dam and infrastructure throughout California.[16] These projects culminated in billions of dollars of contracts that, particularly during a time of economic hardship and shifting social policies, vaulted Kaiser into his career as an industrialist. Such opportunities culminated in the formation of, among others, Kaiser Aluminum and Kaiser Steel. By 1940, with World War II going on, Kaiser ran seven shipyards, ultimately producing nearly 1,500 ships for the U.S. maritime commission.[17] Under the changing social dynamic of the New Deal, Henry Kaiser realized that a healthy workforce was a productive workforce. He also recognized the benefits of partnering with workers and unions to facilitate progress with time-sensitive products. Accordingly, while working in the shipping industry, Henry Kaiser established the first health maintenance organization (HMO) for his employees.[18]

The organization started with a 12-bed desert field hospital with a single physician, Dr. Sidney Garfield, with the sole purpose of treating sick and injured workers. With mounting hospital bills and increasing difficulty in obtaining insurance payments, the administrators adopted a pre-payment method.[19] Within months, thousands of workers were enrolled.[20] Following the end of World War II in 1945, the shipping workforce decreased from 90,000 to 13,000; only about 12 of the 75 members of the medical group remained, ultimately leading to the decision to open the health plan to the public.[21] Within ten years, total enrollment extended to some 300,000 individuals.[22] In 1953, the HMO formally became Kaiser Permanente, consolidating

hospitals with a health plan and various medical groups formally into an integrated healthcare organization, now on the path to paving a new road for American healthcare. [23]

Kaiser Permanente in Current Times

In 2014 Kaiser Permanente held a 7.71% market share of the health insurance industry across the U.S. (see **Appendix B**).[24] Kaiser Permanente served 10.1 million Americans with 7.8 million in California as of July 2015.[25] Thirty-eight hospitals, 619 medical offices, over 60,000 physicians and nurses as well as 177,000 technical, administrative, and clerical employees were part of the integrated system.[26] Besides being a major employer and market force, Kaiser Permanente was a critical leader in the healthcare industry.

Perhaps the most distinctive characteristic of the organization was that, unlike most other hospitals that lost money when discharging patients, Kaiser Permanente saved money by serving as the insurer with a prepaid model. While this ultimately controlled utilization in the long run, critics argued that the scheme deprived patients of needed care and emphasized company profits. Others argued that the structure tended to control customers by restricting which locations or physicians were available for patients.

The integrated healthcare organization included a medical group, hospitals, and a health insurance arm. Kaiser Permanente was a not-for-profit and patient-oriented organization. With its not-for-profit status, Kaiser Permanente avoided the fiduciary responsibility to shareholders common among for-profit hospitals and, likewise, remained tax-exempt. This status demanded Internal Revenue Service reporting of community benefits, losses from Medicaid patients, and the provision of charity care.[27]

For-profit hospitals in California tended to dedicate an average of 1.4% of total operating income to community benefit, whereas not-for-profit hospitals dedicated a slightly higher average, 1.9%. [28] Kaiser Permanente went well beyond that value through the application of a charitable program entitled Direct Community Benefit Investment (DCBI), which served communities through partnerships and initiatives as well as clinics and even public hospitals. DCBI ultimately dedicated some 3.9% of operating revenue in 2014 to community benefit, a figure more than doubling the California averages.[29]

Environmental Regulation

Energy Policy Act of 2005 and ITC Extensions

The Energy Policy Act of 2005 established the first federal investment tax credit (ITC) for renewables. [30] This ITC was an income tax reduction for an organization that financed the installation of a project; in the 2005 act, the tax reduction was worth 30% of the cost for residential and commercial installations from January 1, 2006, to December 31, 2007.[31] Though the initial ITC was to expire before Kaiser Permanente considered renewable installations in 2008, the credit was extended to the end of 2008 with the Tax Relief and Health Care Act of 2006, and then subsequently extended another eight years with the Emergency Economic Stabilization Act of 2008.[32] The ITC extension to 2016 did not apply to wind energy,[33] and ITCs were limited to on-site renewable energy installations. There was an equal incentive for companies (in terms of the ITC) to buy renewable energy produced off-site. These production tax credits (PTCs) were provided as a rebate per kilowatt-hour of power purchased and were also worth 30%,[34] as long as construction began before 2020.[35]

Renewable wind energy saw ITCs and PTCs in constant flux between 1992 and 2014, with the credits expiring six times and six extensions, often even a year after expiration.[36] This created a boom-bust cycle in the wind industry, with industry growth suppressed in years without the credits (see **Exhibit 2**).[37] The extension of the solar ITC and PTC to 2016 ensured an eight-year stable phase for the solar industry. This

stability encouraged the installation of on-site or purchase of off-site solar as opposed to wind since there would be a guarantee of tax credits for eight years starting in 2008.

Exhibit 2
PTC Expiration and Extension Impacts on U.S.-Installed Wind Capacity
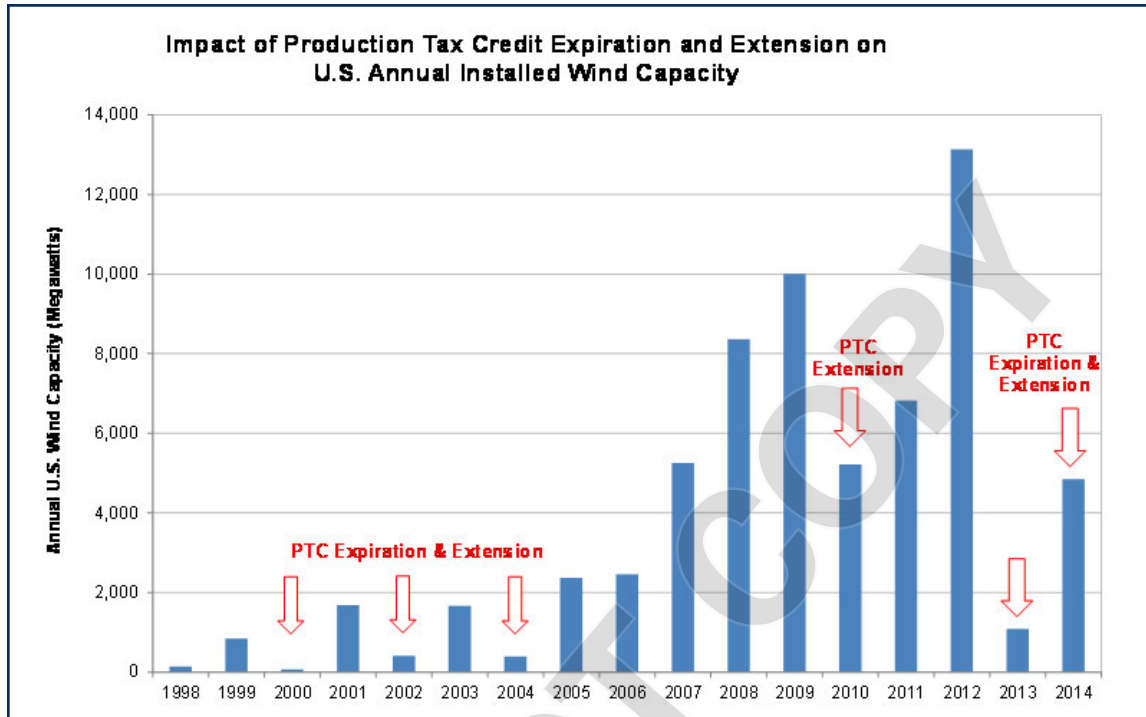
Source: Union of Concerned Scientists. "Production Tax Credit for Renewable Energy." Accessed 1 Dec. 2015. <http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/production-tax-credit-for.html#.Vl22Sd-rTPA>.

California's Greenhouse Gas Reduction Steps

The California legislature had been a domestic leader in combating climate change. The Oakland-based Kaiser Permanente had over 75% of its members living in California as of 2015,[38] and so California's climate legislation could have a huge impact on the company. Some of the state's first steps to combat climate change came with Executive Order (EO) S-3-05, which aimed to bring 2010 greenhouse gas levels to 2000 levels, 2020 emissions to 1990 levels, and 2050 emissions to 80% less than 1990 levels.[39] EO S-3-05 also established a Climate Actions Team and created avenues to enable these reductions.[40] The EO was closely followed by legislation with the same goals: In 2006, Assembly Bill (AB) 32 was introduced to cut statewide emissions to 1990 levels by 2020, reducing emissions by about 30%.[41]

AB 32 included market-based compliance mechanisms that encouraged the creation of a cap-and-trade program in California.[42] Such a program went into effect January 1, 2013.[43] The cap-and-trade program was also made possible by AB 1803, also passed in 2006, which codified a greenhouse gas (GHG) law,[44] allowing companies like Kaiser Permanente to see their impact and the impact of their industry as a whole.

California's Renewable Portfolio Standards

Although EO S-3-05 and AB 32 were created to combat emissions, they did not directly promote the growth of renewable energy development. The first renewable portfolio standard (RPS) in California was passed in 2002 and called for 20% of energy to be renewable by 2017.[45] The 2005 Energy Action Plan set a

goal for 33% of California's energy to come from renewable sources by 2020.[46] To enforce the RPS, utilities sold renewable energy credits (REC) to certify that a given unit of energy came from renewables. On-site renewable production under the RPS could also be classified as RECs.[47] These RECs could either be sold with green energy or individually; RECs were essentially a way to "demonstrate greenness."[48] Companies could claim to have used renewable energy only if they owned the REC that accompanied it. Thus an important cost consideration for the company could have been whether it wanted to retain RECs as a part of PPAs and reduce its carbon footprint, or whether it wanted to sell its RECs.

California's Building Regulations

Part of AB 32's emissions reduction plan called for retrofitting existing buildings to be more energy efficient as well as creating green building standards codes.[49] The retrofit plans were passed in October 2009,[50] and new building codes were adopted three months later.[51] Though these building aspects were not codified into law until after Kaiser Permanente started purchasing renewables in 2008, they were forthcoming since the passage of AB 32. "Greening" buildings could be a viable option for hospitals if they wished to work sustainability into their core competencies.

Sustainability within Kaiser Permanente

The history of environmental stewardship at Kaiser Permanente could be traced to the 1970s when its first Ecology Committee started at its medical center in Santa Clara, California.[52] The Environmental Stewardship Council was the overarching governance group for sustainability and fell within Kaiser Permanente's Community Benefit department. The council worked under three priority areas: sustainable purchasing, sustainable operations, and sustainable buildings.[53]

Kaiser Permanente's work in sustainable buildings began in earnest in 2006 with the establishment of the High Performance Building Committee.[54] Greening its buildings would both bring the company to compliance with AB 32's new building standards and incorporate sustainability into its business model. Kaiser Permanente also became a key player in moving the industry toward greener buildings with the establishment of Green Guide for Health Care.[55] The collaboration between the Green Guide and Kaiser Permanente established building standards that met both health and environmental codes.[56]

To work on making operations and purchasing more sustainable, Kaiser Permanente began to monitor and publicly report GHG emissions.[57] It was the first among U.S. healthcare organizations to do so. The effort began in 2005 and was limited to its operations in California.[58] By 2010, Kaiser Permanente's GHG inventory encompassed Scope I (direct) emissions and Scope II (indirect) emissions from purchased energy for all eight of Kaiser Permanente's regions.[59] The 2010 emissions report included data from 859 locations and showed that Kaiser Permanente was responsible for 859,000 metric tons of CO2 equivalent and its annual use of 1.5 billion kilowatt-hours of electricity contributed to 66% of those emissions. Scope III emissions, or other indirect emissions from activities such as supply chain, transportation in vehicles not owned or controlled by the reporting entity, and waste disposal,[60] were yet to be included in the GHG reporting.[61] Scope III emissions could be significant, especially from pharmaceuticals procurement. The National Health Service of the United Kingdom found that its pharmaceuticals use was the single greatest contributor to the health system's GHG emissions.[62] Kaiser Permanente quickly realized that its efforts to green its operations were helpful, yet incremental. With a fast-growing national membership and facilities footprint, a bolder, game-changing renewable energy strategy was needed.

Future Demand

President Obama signed the Affordable Care Act (ACA) into law in March 2010, and the legislation focused on provisions to expand health insurance coverage, control costs, and improve the healthcare delivery system.[63] By making insurance more affordable, the ACA was projected to decrease the number of uninsured from 47 million in 2009[64] to 26 million by 2020.[65] This meant that demand for high-quality health services was going to increase for organizations such as Kaiser Permanente. Policy analysts projected the increase in new hospital construction nationally to cost $44 billion in 2014 to meet this demand.[66] With this forecast increase in business, big and bold strategies were necessary to meet Kaiser Permanente's absolute 30% reduction goal.[67]

Goal Setting

A 2012 corporate goal to reduce absolute GHG emissions by 30% below 2008 levels by 2020 was motivated by a desire to improve the health of the people in the communities served by Kaiser Permanente. This was not a relative goal; it was not tied to emissions per square foot. Rather, it measured absolute emissions in 2020 against 2008 despite the continued growth of the company. This goal was supported by four strategies:

1. Design efficiency into new buildings (e.g. LEED Gold in Oregon, carbon neutral small hospital design competition).

2. Integrate conservation practices into existing buildings (could contribute to half of GHG reductions).

3. Develop on-site renewables and sustainable energy sources.

4. Purchase off-site renewable energy and renewable energy credits (RECs).[68]

Construction of a 122-bed hospital near Portland, Ore., was planned to be Kaiser Permanente's first LEED Gold-certified hospital in 2013. Implementing projects to reduce demand for energy was estimated to be able to contribute to at least 30% of the GHG reduction target.[69] Demand reduction initiatives targeted Kaiser Permanente's 1,300 fleet vehicles, anesthesia gases used in operating rooms, lighting, and HVAC.[70] During 2010-2012, Kaiser Permanente installed 11 megawatts of solar across a dozen facilities in California.[71] Around the same time, the organization purchased Green-e Energy RECs comprising wind. Kaiser Permanente's REC purchases were able to offset 100% of electricity use in its Maryland and Washington, D.C., facilities in 2012 and 2013.[72]

Implementation Plan

To meet its publicized goal, Kaiser Permanente sent a request for proposals to potential power project developers and selected NextEra Energy Resources to be its exclusive developer for off-site energy[73] and NRG Renew to provide on-site solar energy.

Off-site Solar and Wind Energy

Kaiser Permanente negotiated a 20-year PPA to purchase 110 megawatts of solar and 43 megawatts of wind from NextEra's solar plants and wind farms in California. The agreement allowed NextEra to build and operate the renewable energy projects on behalf of Kaiser Permanente, with the plants expected to be operational in 2016.[74]

On-site Solar

The deal with NRG Renew, a wholly owned subsidiary of NRG Energy Inc., the country's largest independent power producer, would install 70 megawatts of on-site solar at over 100 Kaiser Permanente locations. Most of the arrays were to be placed on Kaiser Permanente's parking structures, totaling to 20,000 parking spaces. This agreement was expected to offset 6%-8% of Kaiser Permanente's energy demand throughout California.[75] The agreement stipulated that NRG would finance, build, and operate the solar equipment and distribute the power back to the health system at a fixed cost over the 20-year contract.[76] Once the projects were completed, Kaiser Permanente's total installed on-site solar capacity would place it among the top three on-site commercial solar portfolios among all U.S. health and beauty companies.[77]

Financial Analysis

A PPA is an alternative to direct ownership of renewable power that eliminates the upfront capital cost of construction and the need for deep in-house expertise. PPAs are financial hedges against increases in the price of energy and are large-scale solutions.[78] Yet implementing a PPA can be a challenging undertaking because of the accounting and operational difficulties. Under PPAs, the energy provider owns, installs, and operates the renewable energy systems. For project developers, PPAs provide a predictable income stream, which is what financiers and banks consider the key to the low cost of capital and preferred financing arrangements; the availability of investment tax credits (ITCs) is also critical in this consideration. When Kaiser Permanente promised to buy the electricity, the project could be built with low-cost financing and deliver electricity at or below non-renewable power prices. Essentially, Kaiser Permanente would pay a fixed price for renewables and would receive renewable energy.

Kaiser Permanente's yearly energy bill was $210-220 million, while overall operating expenses totaled $54 billion in 2014.[79] Energy consumption accounted for only 0.4% of its operating cost and the PPA would cost only $25 million per year, a fraction of Kaiser Permanente's total energy bill. A financial analysis done by Goldman Sachs determined that there was an 80% chance the company would actually see some financial benefit from the PPA, and if not, in the "worst case scenario, it's not going to bankrupt [Kaiser Permanente]... it's decimal dust in the larger scheme of cost structure,"[80] according to Hemstreet.
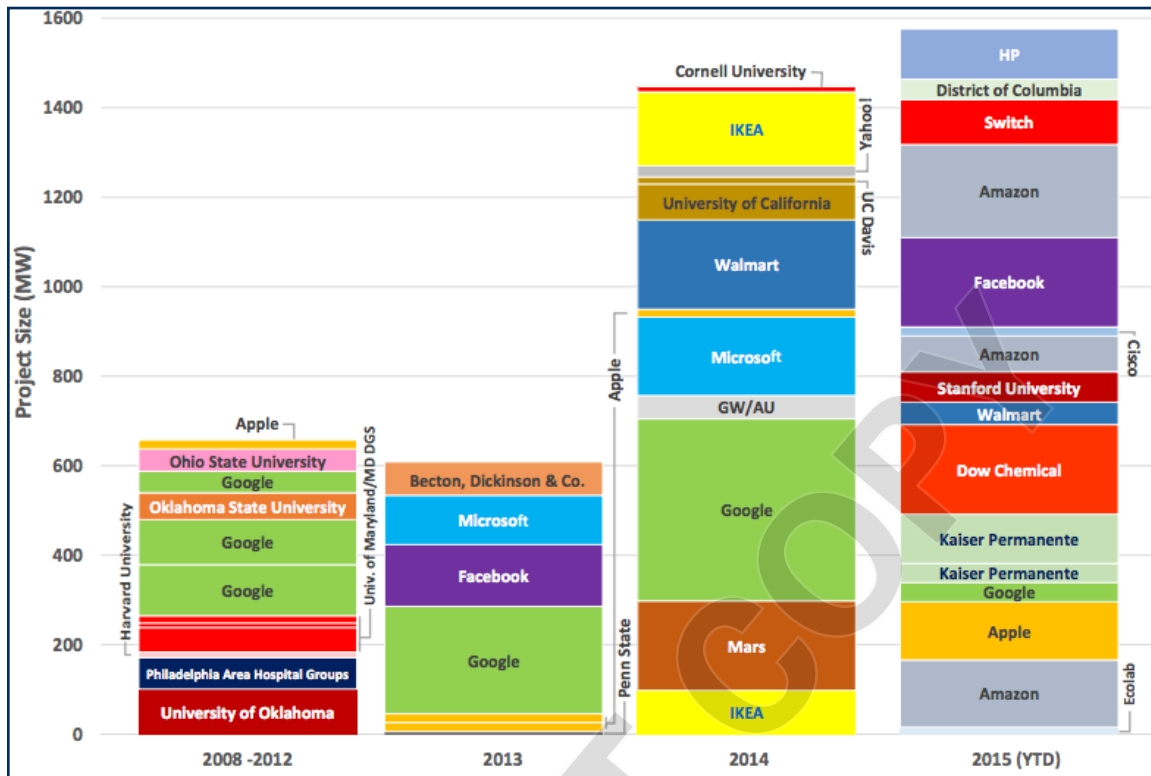
Future of Kaiser Permanente

Joining other Industries

> "Hospitals are beginning to connect the dots between climate change, human health, and their own emissions. We'll be moving more aggressively into renewable energy and lowering carbon emissions. It will transform healthcare construction as we know it."
>
> — A leading architect [81]

The year 2014 brought 17% growth in green energy investments to a total of $270 billion. Undeterred by a sharp drop in crude oil prices, this sudden increase reversed the investment dip of the past two years and was mainly driven by investments in solar and wind energy. Technology costs, particularly in solar, had fallen sharply during the intervening period.[82] Corporate PPAs announced in 2015 were equivalent to about 10% of all new non-residential wind and solar generation forecast to come online in 2016.[83] In consideration of joining Apple, Google, and Walmart in the clean energy-purchasing spree, Kaiser Permanente could become a leader in the healthcare industry with strong commitments to PPAs (see **Exhibit 3**). [84]

Exhibit 3
PPA Investments by Institution (2008-2015)

Source: Staple, Gregory C., and Geoff Bromaghim. "Google Is Just a Small Slice in the New Corporate PPA Boom." GreenBiz. 4 Aug. 2015. Accessed 7 Dec. 2015. <http://www.greenbiz.com/article/google-just-small-slice-new-corporate-ppa-boom>.

Benefits for Kaiser Permanente

"Pursuing clean energy opportunities is not only the right thing to do for our communities, it makes good business sense."

— Ramé Hemstreet, vice president for operations and chief
sustainable resource officer, Kaiser Permanente[85]

Renewable energy investment would facilitate Kaiser Permanente's GHG emissions reduction goal by 2017, three years ahead of schedule. Additionally, it protected the organization from the risk of energy-price escalation by locking in costs for 20 years. Renewables also diversify energy portfolios and support health care providers' core mission of improving health.[86] Planning to purchase enough renewable energy to provide half of the electricity it used at its California hospitals and health care facilities, the company expected to save between $5 million and $15 million over the course of long-term PPAs it made.[87]

Benefits for Healthcare Industry

"There is a direct link between healing the individual and healing this planet. We will not have healthy individuals, healthy families, and healthy communities if we do not have clean air, clean water and healthy soil. ... It is our core business to minimally impact the environment and to provide an optimum health[y] and safe environment for our workers and our patients."

— Lloyd Dean, president and CEO of Catholic Healthcare West[88]

Renewable energy investments can reduce physical fuel consumption, then reduce risks of being exposed to fossil fuel price volatility. Margins from lowering healthcare utility expenses could be reinvested into more sustainable and patient-centric projects. According to the U.S. Department of Energy, reduced greenhouse gas emissions could save more than $20 billion annually in U.S. health care costs through lowering the incidence of cancer, liver, and kidney disease, and reproductive problems.[89]

Partnerships

Sustainability in Healthcare

Health Care Without Harm (HCWH) is a grassroots coalition established in 1996 that seeks to address the healthcare industry's environmental footprint. HCWH's founder, Gary Cohen, stressed the responsibility and opportunities within healthcare to integrate sustainability and shift markets: "Healthcare is one of the few industries that has the economic clout, the scientific expertise, the public credibility, and, perhaps most important, the motivations and mission to 'do no harm' and to change practices that may cause harm." By 2015, the coalition grew into a movement that spanned healthcare organizations in 50 countries. The coalition was at the forefront of many successful campaigns, including the virtual elimination of medical waste incineration and mercury use in medical devices.[90] Kaiser Permanente was one of the original organizations in the coalition.

Practice Greenhealth

The history of Practice Greenhealth can be traced back to June 1998 when the American Hospital Association and the U.S. Environmental Protection Agency signed a landmark agreement to advance pollution prevention efforts in healthcare facilities. The agreement became the foundation of the Hospital for a Healthy Environment (H2E) program. Its main goals included virtual elimination of mercury waste, reduction of the healthcare sector's total waste volume, chemical waste minimization, and a variety of educational and information-sharing activities focused on pollution prevention and toxics minimization. In January 2008, H2E was reorganized and renamed Practice Greenhealth. The organization remained committed to the integration of sustainability principles and practices as a means to better protect the health of patients, staff, the communities served, and the environment.[91]

Practice Greenhealth helped hospitals reduce energy consumption. Practice Greenhealth introduced the Healthcare Renewable Energy Initiative (HREI) in a partnership with Citigroup, an initiative that offered transparent and flexible financing options to facilitate the greening of health systems.[92]

The HREI involved two phases:

1. An independent engineering firm would conduct a thorough analysis of the potential feasibility of renewable energy alternatives for the health system, based on an analysis of the physical plant and existing energy use patterns.[93]

2. If the engineering assessment indicated feasibility, Citi would work with the hospital to assess, finance, and implement the most cost-effective structure to purchase green energy. In most cases, the most cost-effective structure to achieve these goals was a PPA. [94]

Citi – A Leader in Renewable Energy Investment

Citi was ranked the No. 1 underwriter for not-for-profit hospitals and health systems. Citi took concrete steps to address and mitigate climate change by investing $50 billion over 10 years into sustainable development investments and produced equity research related to climate issues. Citi planned to lend, invest, and facilitate deals worth $100 billion by 2025 to support projects that would fight climate change

and protect the environment. It expected the effort to lead to deals that support renewable power, energy efficiency, and sustainable transportation opportunities.[95]

Goldman Sachs – Bet on Being Green

Over the last decade, Goldman Sachs, one of Wall Street's most profitable firms, financed $65 billion in clean energy around the world, structured over $14 billion in weather-related catastrophe bonds, and invested $3.3 billion in green operational investments with over 50% of its global office portfolio going green-building certified.[96] Goldman Sachs was at the forefront of innovative green finance, including the first rated solar securitization, the first U.S. YieldCo listing, the first century green bond, and the first green market securitization.[97] In 2012, Goldman Sachs extended its longstanding commitment to support renewable energy by establishing a global target of $40 billion in financing and co-investments toward clean technology over the coming decade. A quarter of this amount was to go to distributed-generation renewables like solar in the U.S. through 2021.[98] Goldman Sachs provided Kaiser Permanente the financial analysis it needed to go forward with its PPA.

Hospital Energy Alliance

Founded in 2009, the Hospital Energy Alliance (HEA) connected its members with an experienced network of hospital energy experts, providing them with the information, tools, training, and resources to help make their buildings more efficient. Since its launch, HEA grew to include over 57 members representing over a half billion square feet of space, accounting for about 28% of the sector. Through HEA, these healthcare organizations focused on energy efficiency as a win-win solution to improve facilities, reduce environmental impacts, and save limited hospital resources, resources that could be redirected to hire staff, purchase medical equipment, and improve patient experience.[99]

Other Movers in the Industry

One of Kaiser Permanente's smaller peers in the HCWH community was Gundersen Health System in Wisconsin.[100] After a six-year journey, the not-for-profit health network became the first hospital to offset all of its fossil fuel use with locally sourced renewable energy in late 2014, even generating a small surplus of green energy. Gundersen incorporated biomass, wind, and geothermal in a $2-million capital investment that reduced its energy costs by $1.2 million annually and made it energy-independent. Much of the energy savings came from reduced consumption, and the organization encouraged other healthcare providers to follow suit.[101]

Moving Forward

Hemstreet read the news releases of Gundersen's success in achieving energy independence and he pondered Kaiser Permanente's next steps in sustainability. Environmental stewardship had long been a part of the company's vision, but now with climate change threatening the very health of its patients, fitting sustainability into its core competencies was clearly vital. No doubt the company had come a long way since renewables were first proposed in that serendipitous meeting in 2006, with a pledge to cut its GHG emission by 30% of 2008 levels by 2020, and renewables already installed on-site.

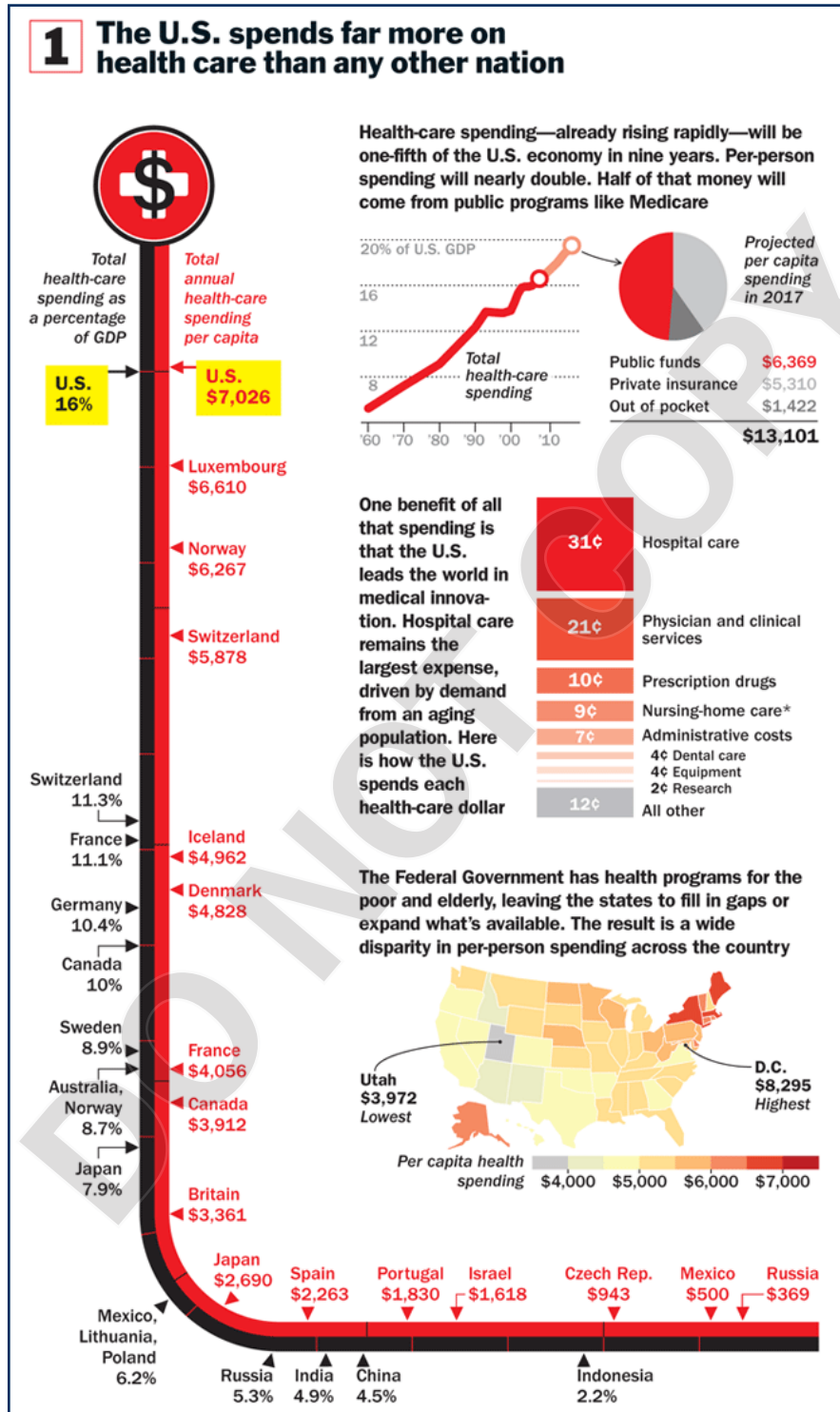How could the vice president for operations and chief sustainable resource officer convince the executive team and board of directors to further their commitments in renewable energy? How long would the window of opportunity to claim investment tax credits and other incentives last given the political environment? What kind of contingencies should Kaiser Permanente prepare for if federal incentives disappear? How

financially attractive is it to adopt renewables on a large scale? Should this be the only decision criterion? How should sustainability fit into the core competencies of a healthcare company like Kaiser Permanente?

Appendices

Appendix A
United States Healthcare Spending

1 **The U.S. spends far more on health care than any other nation**

Health-care spending—already rising rapidly—will be one-fifth of the U.S. economy in nine years. Per-person spending will nearly double. Half of that money will come from public programs like Medicare

Total health-care spending as a percentage of GDP

Total annual health-care spending per capita

U.S. 16%
U.S. $7,026

20% of U.S. GDP
Total health-care spending

Projected per capita spending in 2017

Public funds	$6,369
Private insurance	$5,310
Out of pocket	$1,422
	$13,101

◄ Luxembourg $6,610

◄ Norway $6,267

◄ Switzerland $5,878

One benefit of all that spending is that the U.S. leads the world in medical innovation. Hospital care remains the largest expense, driven by demand from an aging population. Here is how the U.S. spends each health-care dollar

31¢ Hospital care
21¢ Physician and clinical services
10¢ Prescription drugs
9¢ Nursing-home care*
7¢ Administrative costs
4¢ Dental care
4¢ Equipment
2¢ Research
12¢ All other

Switzerland 11.3%
France ▶ 11.1%
Germany ▶ 10.4%
Canada 10%
Sweden 8.9%
Australia, Norway 8.7%
Japan 7.9%

Iceland ◄ $4,962
Denmark ◄ $4,828

France ◄ $4,056
Canada ◄ $3,912

Britain ◄ $3,361

The Federal Government has health programs for the poor and elderly, leaving the states to fill in gaps or expand what's available. The result is a wide disparity in per-person spending across the country

Utah $3,972 *Lowest*

D.C. $8,295 *Highest*

Per capita health spending $4,000 $5,000 $6,000 $7,000

Japan $2,690
Spain $2,263
Portugal $1,830
Israel $1,618
Czech Rep. $943
Mexico $500
Russia $369

Mexico, Lithuania, Poland 6.2%

Russia 5.3%
India 4.9%
China 4.5%
Indonesia 2.2%

Source: Time Magazine. "5 Truths About Health Care in America." 14 Dec. 2008. Accessed 11 Mar. 2016.
<http://blogs2.muskegonisd.org/bwood/files/2008/12/5-graphs-_1-total-cost1.pdf>.

Appendix B
Top 25 Health Insurance Companies by Market Share

Rank	Business Type	Company	Direct Written Premium	Market Share (%)
1	L,H,CA	UnitedHealth Group	98,522,822,950	11.95
2	H,CA	Kaiser Foundation Group	63,544,708,436	7.71
3	L,H,CA	Anthem Inc Group	52,431,737,650	6.36
4	L,H,CA	Aetna Group	48,247,185,344	5.85
5	L,H	Humana Group	45,822,550,666	5.56
6	L,H,P	HCSC Group	28,894,004,788	3.51
7	L,H,CA	Cigna Health Group	21,420,876,652	2.60
8	L	Aflac Group	14,601,367,718	1.77
9	L,H,P,CA	Highmark Group	14,496,790,543	1.76
10	L,H	Centene Corp Group	13,644,856,212	1.66
11	CA	Blue Shield of California Group	13,373,556,000	1.62
12	H	Independence Blue Cross Group	12,249,432,297	1.49
13	CA	California Physicians' Service	11,300,553,000	1.37
14	H	Wellcare Group	11,160,010,636	1.35
15	L,H	Guidewell Mutual Holdings Group	10,767,451,765	1.31
16	L,H	BCBS of Michigan Group	10,479,804,058	1.27
17	L,H,CA	Molina Healthcare Inc. Group	10,056,272,654	1.22
18	H,CA	BCBS of New Jersey Group	10,010,658,296	1.21
19	H,CA	HIP Insurance Group	8,439,626,477	1.02
20	H,CA	Carefirst Inc. Group	7,885,227,808	0.96
21	CA	Health Net of California, Inc.	7,418,559,984	0.90
22	H	BCBS of North Carolina Inc.	7,353,537,575	0.89
23	L,H,P,CA	Metropolitan Group	6,766,180,842	0.82
24	H	BCBS of Massachusetts Group	6,625,095,792	0.80
25	CA	UHC of California	6,195,357,000	0.75

Source: National Association of Insurance Commissioners (NAIC). "2014 Market Share Reports." 2015. Accessed 8 Jan. 2016.
<http://www.naic.org/documents/prod_serv_statistical_msr_hb.pdf>.

Endnotes

3   Kaiser Permanente. "Green Power as a Prescription for Good Health." 2016. Accessed 11 Jan. 2016. <https://thrive.kaiserpermanente.org/care-near-you/northern-california/southsanfrancisco/news-events/green-power-as-a-prescription-for-good-health/>.

4   Kaiser Permanente. "Kaiser Permanente Pledges to Reduce its Carbon Footprint by 30 percent by 2020." Accessed 4 Dec. 2015. <http://share.kaiserpermanente.org/article/kaiser-permanente-pledges-to-reduce-its-carbon-footprint-by-30-percent-by-2020>.

5   Kaiser Permanente. "Our history." Accessed 4 Dec. 2015. <http://share.kaiserpermanente.org/article/history-of-kaiser-permanente/>.

6   Obamacare Facts. "Health Care Facts: Why America Needs Health Care Reform." Accessed 14 Jan. 2016. <http://obamacarefacts.com/healthcare-facts/>.

7   Centers for Medicare & Medicaid Services. "Historical." Accessed 14 Jan. 2016. <https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html>.

8   Heilbrunn, Evi. "Top Health Insurance Companies." *U.S. News.* Nov. 2014. Accessed 14 Jan. 2016. <http://health.usnews.com/health-news/health-insurance/articles/2013/12/16/top-health-insurance-companies>.

9   Obamacare Facts.

10   CNN Money. "World's Largest Economies." Accessed 14 Jan. 2016. <http://money.cnn.com/news/economy/world_economies_gdp/>.

11   Deloitte Touche Tohmatsu Limited. "2015 Global Life Sciences Outlook: Adapting in an Era of Transformation." 2014. Accessed 14 Jan. 2016. <https://www2.deloitte.com/content/dam/Deloitte/global/Documents/Life-Sciences-Health-Care/gx-lshc-2015-life-sciences-report.pdf>.

12   Schneider Electric. "How to Improve Your Hospital's Financial Health." 2011. Accessed 14 Jan. 2016. <http://www.schneider-electric.com/solutions/ww/en/med/4662732/application/pdf/1312_1172-998-4483_gma_lowres.pdf>.

13   Schneider Electric.

14   Chung, Jeanette W., and David O. Meltzer. "Estimate of the Carbon Footprint of the US Health Care Sector." *Journal of the American Medical Association,* 302.18 (2009): 1967-1972. Accessed 14 Jan. 2016. <http://jama.jamanetwork.com/article.aspx?articleid=184856>.

15   Patz, Jonathan A., et al. "Impact of Regional Climate Change on Human Health." *Nature.* 17 Nov. 2005. Accessed 28 Jan. 2016. <http://www.nature.com/nature/journal/v438/n7066/full/nature04188.html>.

16   Knowlton, Kim, et al. "Six Climate Change-Related Events in the United States Accounted for About $14 Billion in Lost Lives and Health Costs." *Health Affairs.* Nov. 2011. Accessed 3 Feb. 2016. <http://content.healthaffairs.org/content/30/11/2167.full>.

17   Knowlton et al.

18   Schanetzky, Tim. "Business in the Age of Big Government and Way: Henry J. Kaiser and Friedrich Flick." Accessed 14 Jan. 2016. <http://www.immigrantentrepreneurship.org/entry.php?rec=59>.

19   Encyclopedia Britannica. "Henry J Kaiser: American Industrialist." Accessed 3 Feb. 2016. < http://www.britannica.com/biography/Henry-J-Kaiser>.

20   Encyclopedia Britannica.

21   Kaiser Permanente. "Our history."

22   Kaiser Permanente. "Our history."

23   Kaiser Permanente. "Our history."

24   Kaiser Permanente. "Our history."

25   Kaiser Permanente. "Our history."

26   National Association of Insurance Commissioners (NAIC). "2014 Market Share Reports." 2015. Accessed 8 Jan. 2016. <http://www.naic.org/documents/prod_serv_statistical_msr_hb.pdf>.

27   Kaiser Permanente. "Fast Facts about Kaiser Permanente." Accessed 3 Feb. 2016. <http://share.kaiserpermanente.org/article/fast-facts-about-kaiser-permanente/>.

28   Kaiser Permanente. "Fast Facts About Kaiser Permanente."

29   Valdovinos, Erica, et al. "In California, Not-For-Profit Hospitals Spent More Operating Expenses on Charity Than For-Profit Hospitals Spent." *Health Affairs.* Aug 2015. Accessed 11 Jan 2016. <http://content.healthaffairs.org.proxy.lib.umich.edu/content/34/8/1296.full>.

30   Valdovinos et al.

31 KPMG. "Kaiser Foundation Health Plan, Inc., and Subsidiaries and Kaiser Foundation Hospitals and Subsidiaries. Notes to Combined Financial Statements." 31 Dec. 2014. Accessed 11 Jan. 1016. <http://emma.msrb.org/ER842441-ER657716-ER1059463.pdf>.

32 Solar Energies Industries Association. "Solar Investment Tax Credit (ITC)." Accessed 30 Nov. 2015. <http://www.seia.org/policy/finance-tax/solar-investment-tax-credit>.

33 Solar Energies Industries Association.

34 Gerwig, Kathy. "The Greening Health: How Hospitals Can Heal the Planet." Kaiser Permanente. Accessed 30 Nov. 2015. <http://share.kaiserpermanente.org/article/the-greening-health-care-book/>.

35 U.S. Department of Energy. "Economic Stabilization Bill Includes Clean Energy Tax Incentives." EERE Network News. 8 Oct. 2008. Accessed 3 Feb. 2016. <http://apps1.eere.energy.gov/news/news_detail.cfm/news_id=12025>.

36 Cusick, Daniel. "Renewables Boom Expected Thanks to Tax Credit." *Scientific American*. 21 Dec. 2015. Accessed 11 Jan. 2016. <http://www.scientificamerican.com/article/renewables-boom-expected-thanks-to-tax-credit/>.

37 Dvorak, Paul. "Five Things You Need to Know About the Extension of the ITC/PTC." *Windpower Engineering & Development*. 6 Jan. 2016. Accessed 11 Jan. 2016. <http://www.windpowerengineering.com/policy/five-things-you-need-to-know-about-the-extension-of-the-itcptc>.

38 Union of Concerned Scientists. "Production Tax Credit for Renewable Energy." Accessed 1 Dec. 2015. <http://www.ucsusa.org/clean_energy/smart-energy-solutions/increase-renewables/production-tax-credit-for.html#.Vl22Sd-rTPA>.

39 Union of Concerned Scientists.

40 Kaiser Permanente. "Fast Facts about Kaiser Permanente."

41 Office of Gov. Edmund G. Brown Jr. "Executive Order S-3-05." 1 June 2005. Accessed 11 Jan. 2016. <https://www.gov.ca.gov/news.php?id=1861>.

42 California Environmental Protection Agency Air Resource Board. "Assembly Bill 32 Overview." Accessed 2 Dec. 2015. <http://www.arb.ca.gov/cc/ab32/ab32.htm>.

43 California Environmental Protection Agency Air Resource Board. "California's Climate Plan." Accessed 1 Dec. 2015. <http://www.arb.ca.gov/cc/cleanenergy/clean_fs2.htm>.

44 California Environmental Protection Agency Air Resource Board. "Assembly Bill 32 Overview."

45 California Environmental Protection Agency Air Resource Board. "Assembly Bill 32 Overview."

46 California Environmental Protection Agency Air Resource Board. "California Greenhouse Gas Emission Inventory Program." Accessed 3 Dec. 2015. <http://www.arb.ca.gov/cc/inventory/inventory.htm>.

47 California Public Utilities Commission. "RPS Program Overview." Accessed 2 Dec. 2015. <http://www.cpuc.ca.gov/RPS_Overview/>.

48 California Public Utilities Commission.

49 State of California State Energy Resources Conservation and Development Commission. "Resolution NO: 14-1007-10." 7 Oct. 2014. Accessed 11 Jan. 2016. <http://www.energy.ca.gov/renewables/documents/2014-10-07_RPS_Resolution_Number_14-1007-10.pdf>.

50 Keyak, Jeff. Phone interview. 13 Nov. 2015.

51 California Environmental Protection Agency Air Resources Board. "California Green Building Strategy." Accessed 2 Dec. 2015. <http://www.arb.ca.gov/cc/greenbuildings/greenbuildings.htm>.

52 California EPA Air Resources Board. "Existing Building Retrofits." Accessed 2 Dec. 2015. <http://www.arb.ca.gov/cc/greenbuildings/retrofits.htm>.

53 California EPA Air Resources Board. "Green Building Standards Code." Accessed 2 Dec. 2015. <http://www.arb.ca.gov/cc/greenbuildings/standards.htm>.

54 Gerwig.

55 Gerwig.

56 Gerwig.

57 Zimmerman, Greg. "Evaluating Green Products." *Building Operating Management*. July 2006. Accessed 12 Jan. 2016. <http://www.facilitiesnet.com/green/article/Sustainable-Design-Beyond-Cost-and-Performance-Facilities-Management-Green-Feature--4808>.

58 Houghton, Adele, and Kevin Hall. "Resource Review: Green Guide for Health Care." American Institute of Architects. Feb. 2007. Accessed 12 Jan. 2016. <http://www.aia.org/aiaucmp/groups/secure/documents/pdf/aiap016402.pdf>.

59 Gerwig.

60 Gerwig.

61 Gerwig.

62 Greenhouse Gas Protocol. "FAQ." Accessed 30 Nov. 2015. <http://www.ghgprotocol.org/calculation-tools/faq>.

63 Gerwig.

64 NHS Sustainable Development Unit. "NHS England Carbon Footprint," 2012. Accessed 30 Nov. 2015. <http://www.sdu.nhs.uk/documents/publications/NHS_Carbon_Footprint_Published_2012.pdf>.

65 National Academy of Sciences. "The Impacts of the Affordable Care Act on Preparedness Resources and Programs: Workshop Summary." 27 Aug. 2014. Accessed 10 Jan. 2016. <http://www.ncbi.nlm.nih.gov/books/NBK241388/>.

66 The Henry J. Kaiser Family Foundation. "How Will the Uninsured Fare Under the Affordable Care Act?" 7 Aug. 2014. Accessed 3 Dec. 2015. <http://kff.org/health-reform/fact-sheet/how-will-the-uninsured-fare-under-the-affordable-care-act/>.

67 Congressional Budget Office. "Insurance Coverage Provisions of the Affordable Care Act— CBO's March 2015 Baseline." Accessed 3 Dec. 2015. <https://www.cbo.gov/sites/default/files/cbofiles/attachments/43900-2015-03-ACAtables.pdf>.

68 Myers, David. "Medical Facilities in the Age of Obamacare." *Urban Land Magazine*. 3 Mar. 2014. Accessed 3 Dec. 2015. <http://urbanland.uli.org/sustainability/medical-facilities-in-the-age-of-obamacare/>.

69 Hemstreet, Ramé Phone interview. 20 Nov. 2015.

70 Gerwig.

71 Gerwig.

72 Gerwig.

73 Gerwig.

74 Gerwig.

75 Kelly, Ian. "Kaiser Permanente Buys 153 MW of Wind and Solar Power." Rocky Mountain Institute. 1 Apr. 2015. Accessed 3 Dec. 2015. <http://blog.rmi.org/blog_2015_4_1_kaiser_permanente_buys_153_mw_of_wind_and_solar_power>.

76 PR Newswire. "Kaiser Permanente Makes Major Wind and Solar Energy Purchases." 18 Feb. 2015. Accessed 3 Dec. 2015. <http://www.prnewswire.com/news-releases/kaiser-permanente-makes-major-wind-and-solar-energy-purchases-300037552.html>.

77 NRG Renew LLC. "NRG Renew to Deliver America's Largest Solar Solution for a Healthcare Provider." 18 Feb. 2015. Accessed 3 Dec. 2015. <http://investors.nrg.com/phoenix.zhtml?c=121544&p=irol-newsArticle&ID=2017705>.

78 Ferenc, Jeff. "Kaiser Will Increase Use of Solar and Wind Power." *Health Facilities Management*. 23 Apr. 2015. Accessed 3 Dec. 2015. <http://www.hfmmagazine.com/display/HFM-news-article.dhtml?dcrPath=/templatedata/HF_Common/NewsArticle/data/HFM/Magazine/2015/May/upfront-energy>.

79 Solar Energy Industries Association. "Solar Means Business 2014: Top U.S. Commercial Solar Users." Accessed 3 Dec. 2015. <http://www.seia.org/research-resources/solar-means-business-2014-top-us-commercial-solar-users>.

80 Lazarova, Iliana. "Power-Purchase Agreements Propel Corporations Toward Clean Energy." Clean Energy Finance Forum. 22 Nov. 2015. Accessed 3 Dec. 2015. <http://cleanenergyfinanceforum.com/2015/11/22/power-purchase-agreements-propel-corporations-toward-clean-energy>.

81 KPMG.

82 Hemstreet.

83 DPR Construction. "The Future of Healthcare: A New Focus on Wellness, Integration and Community Embeddedness." July 2012. Accessed 12 Jan. 2016. <https://www.dpr.com/assets/docs/the-future-of-healthcare.pdf>.

84 Bloomberg New Energy Finance. "Global Trends in Renewable Energy Investment 2015." Frankfurt School of Finance & Management. 2015. Accessed 16 Jan. 2016. <http://fs-unep-centre.org/sites/default/files/attachments/key_findings.pdf>.

85 Staple, Gregory C., and Geoff Bromaghim. "Google Is Just a Small Slice in the New Corporate PPA Boom." *GreenBiz*. 4 Aug. 2015. Accessed 7 Dec. 2015. <http://www.greenbiz.com/article/google-just-small-slice-new-corporate-ppa-boom>.

86 Staple and Bromaghim.

87 Clancy, Heather. "Apple, IKEA, Walmart: 12 leaders in on-site renewables." *GreenBiz*. Accessed 16 Jan. 2016. <http://www.greenbiz.com/article/Apple-Google-Walmart-corporate-renewables-leaders>.

88 Kaiser Permanente. "Kaiser Permanente Makes Major Wind and Solar Energy Purchases." 18 Feb. 2015. Accessed 7 Dec. 2015. <http://share.kaiserpermanente.org/article/kaiser-permanente-makes-major-wind-and-solar-energy-purchases>.

89 Ferenc.

90 Karolides. Alexis, et al. "Design for Health: Summit for Massachusetts Health Care Decision Makers." Rocky Mountain Institute and Health Care Without Harm. Accessed 16 Jan. 2016. <https://noharm-global.org/sites/default/files/documents-files/38/Design_for_Health_Summit.pdf>.

[91] Kaplan, Susan et al. "Can Sustainable Hospitals Help Bend the Health Care Cost Curve?" The Commonwealth Fund. November 2012. Accessed 12 Jan. 2016. <http://www.greenribboncommission.org/downloads/bending_the_curve.pdf>.

[92] Healthcare without Harm. "History and Victories." Accessed 2 Dec. 2015. <https://noharm-uscanada.org/content/us-canada/history-and-victories>.

[93] Practice Greenhealth. "The history of Practice Greenhealth." Accessed 14 May 2015. <https://practicegreenhealth.org/about/history>.

[94] Practice Greenhealth and Citi. "Healthcare Renewable Energy Initiative: Pilot Partnership Program to Promote & Implement Renewable Energy Systems for Hospitals." Accessed 16 Jan. 2016. <https://practicegreenhealth.org/sites/default/files/upload-files/citi-pgh_brochure_web.pdf>.

[95] Practice Greenhealth and Citi.

[96] Practice Greenhealth and Citi.

[97] Practice Greenhealth and Citi.

[98] Goldman Sachs. "Goldman Sachs Announces $150 Billion Clean Energy Target by 2025 in New Environmental Policy Framework." Accessed 31 Nov. 2015. <http://www.goldmansachs.com/media-relations/press-releases/current/announcement-11-2-15.html>.

[99] Goldman Sachs.

[100] The White House. "Fact Sheet: President Obama Announces Commitments and Executive Actions to Advance Solar Deployment and Energy Efficiency." 9 May 2014. Accessed 7 Dec. 2015. <https://www.whitehouse.gov/the-press-office/2014/05/09/fact-sheet-president-obama-announces-commitments-and-executive-actions-a>.

[101] U.S. Department of Energy. "Hospital Energy Alliance: 2012 Annual Report." October 2012. Accessed 16 Jan. 2016. <http://apps1.eere.energy.gov/buildings/publications/pdfs/alliances/hea_annual_report_2012.pdf>.

[102] Envision Gundersen Health System. "Gundersen Reaches First Days of Energy Independence." 10 Nov. 2014. Accessed 7 Dec. 2015. <http://www.gundersenenvision.org/gundersen-reaches-first-days-of-energy-independence>.

[103] Moore, Rodney J. "Gundersen Health Goes Off the Grid, Saves Money as Energy Independent Hospital." Healthcare Finance. 3 Feb. 2015. Accessed 7 Dec. 2015. <http://www.healthcarefinancenews.com/news/gundersen-health-goes-grid-saves-money-energy-independent-hospital>.

Notes