PRELIMINARY AGENDA
GLOBAL SOLUTIONS SUMMIT 2016
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William J. Clinton Presidential Library
Little Rock, Arkansas

DAUNTING CHALLENGES; DAZZLING OPPORTUNITIES: SCALEABLE TECHNOLOGY DEPLOYMENT FOR SUSTAINABLE DEVELOPMENT

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The Global Cleantech Cluster Association (GCCA), the P80 Group Foundation (P80), and the Global Technology Deployment Initiative (GTDI) are convening a Global Solutions Summit (GSS) around the theme of "Daunting Challenges and Dazzling Opportunities: Scaleable Technology Deployment for Sustainable Development." The Summit will convene on December 13-14, 2016 at the William J. Clinton Presidential Library in Little Rock, Arkansas.

GSS 2016 will meet in collaboration with the Club de Madrid (CdM), an organization comprised of more than 100 former Presidents, Prime Ministers and Heads of State which will be reconvening in the Club de Madrid - P80 Group "Reunion Proceedings;" the 6th GCCA Awards Dinner representing more than 10,000 cleantech companies in more than 50 clusters around the world; and a Fulbright Scholar Alumni Diplomats Reunion Meeting. The 2016 Summit builds on the widely-acclaimed inaugural Global Solutions Summit which met at the US State Department in April 2014. See here for a brief summary of the guiding philosophy behind the Inaugural GSS. Additional Summits are tentatively planned for London in 2017 and Santiago, Chile in 2018.

A. Introduction

GSS 2016 is based on two fundamental principles.

- The first is that scaling up the commercial deployment of proven technology may be the most effective and efficient way to achieve many of the Sustainable Development Goals (SDGs). As President Clinton noted more than 20 years ago, *"Nearly every problem has been solved by someone, somewhere. The frustration is that we can't seem to replicate (those solutions) anywhere else."* We agree. Rather than reinventing the wheel in an endless succession of pilot projects that rarely get scaled up and transferred from one part of the world to another, we need to harness business model and financial market innovations to scale up the commercial deployment of successful projects and technological innovations. Not only is this a pragmatic solution to a pressing problem, but it is also an outstanding, untapped business opportunity. As Jigar Shah, the Founder of Sun Edison and former CEO of the Carbon War Room noted, *"Deploying solutions we have already invented represents the greatest wealth-creation opportunity of our lifetime."* Or as one of his financial colleagues remarked, *"We believe that the biggest impacts in sustainability will be found in scaling the adoption of existing technology. While significant capital has flowed to inventing new venture-backed technologies, we believe that the best risk-adjusted returns are available in financing the deployment of proven products and services."*

- The second is that the world today is awash in **proven** technology that could immediately help countries achieve many of the SDGs and new technologies are emerging at an exponential rate. Proven technologies exist for producing and storing renewable, distributed energy; for converting brackish water, polluted ground water and waste water into affordable WHO-quality potable water; for developing sustainable vertical agriculture in urban settings; for sustainable food processing and off-grid refrigeration and cold storage; for installing and operating pollution-reducing, renewable waste-to-energy facilities; for delivering modern, low-cost, high quality health care even in remote villages that currently lack access to potable water or on-grid electricity; for 3-D printing and localized manufacturing; for building low-cost, high-performance housing, retail and office buildings, and roads in rapidly growing urban areas; among many others.

  These technologies can generate world class performance at radically lower prices. Moreover, by bringing their benefits within financial reach of the tens, if not hundreds, of millions of aspiring consumers and producers in both developed and developing countries, the large-scale commercial deployment of these technologies could serve as a driver of global growth as well as fertile source of "bankable" investment opportunities for pension funds, sovereign wealth funds, foundations, family funds, the crowd, the Diaspora, local collectives and community investment trusts, and other institutional and individual investors. Simultaneously, they would permit developed and developing countries to install distributed networks of high-performance, lower-cost, smaller-scale technology while reducing their near total reliance on more expensive, utility scale technologies, much like the cell phone enabled consumers in developed and developing countries to bypass more expensive, lower-performance fixed-line telephony.

But if these two assumptions are correct, why isn't this technology being deployed more rapidly and widely around the world? Why doesn't every urban neighborhood and rural village have access to potable water and renewable energy? After all, we already know how to do all of these things using readily-available, "off-the-shelf" technology. If we can make enormous progress simply by deploying what we already know how to do, why aren't we doing it? What are the obstacles? Why is it so difficult to scale-up the commercial deployment of these scaled-down technologies? More importantly, what are the solutions?

B. Broken Circuits

GSS 2016 is predicated on the assumption that a number of "broken circuits" are impeding the flow of capital and technology.

- In the **financial** realm, for example, managers of such large institutional investors as pension funds, sovereign wealth funds, family funds, and foundation and university endowments, among others are deterred by the perceived political, commercial, technological and corporate governance risk associated with investing in pioneer projects in emerging and pioneer markets. In addition, fund managers lack detailed information about individual projects in emerging markets and, even if they had this information, they do not have the personnel or technical capacity to perform due diligence on individual emerging markets, projects, or enterprises. Finally, until fairly recently, there was a mismatch between the large volume of capital that most institutional investors want to invest in one fell swoop and the much smaller amounts that can be absorbed by investments in smaller-scale projects, including those based on distributed networks of smaller-scale technology. At the other end of the spectrum, until recently, there was a dearth of financial instruments and platforms for aggregating the smaller amounts available from millions of potential investors in the "crowd" and Diaspora and investing them in specific projects in emerging markets and also for aggregating smaller emerging market projects into larger investment vehicles attractive to institutional investors.

- In the **innovation** realm, technical innovations and scientific inventions **by themselves** are powerless to have an impact on any SDG. For example, consider the case of a scientist who invents a low-cost nanofilter for converting salt water, brackish water, or polluted fresh water into EPA or WHO-quality drinking water at a price that is affordable for the vast majority of residents in emerging markets. In theory, the solution to the drinking water problem would be in hand. But inventing such a filter in the laboratory is not the same as producing commercial volumes of these filters at a cost-effective price or selling those filters to local entrepreneurs who will use them in businesses that produce and sell drinking water to local consumers. In other words, scientists and innovators with useful discoveries need to identify entrepreneurs who can convert these scientific advances into products and businesses tailored to the needs and customs of local consumers. And conversely, entrepreneurs in emerging markets need the capacity to find, adapt and adopt useful technology. Matching this potential supply and demand seems fairly simple in theory – just build a data base and let people find each other via the internet – but real world experience suggests that life is frequently more complicated.

- In the **business and technology deployment** realm, there is a dearth of mechanisms for moving technology from places where it has been invented and deployed initially to other places where it is needed. Small businesses with potentially game changing clean drinking water or renewable energy technologies, for example, often lack the financial, managerial, and organizational capacity to market their solutions in emerging markets. Many of these companies simply do not have the capital, staff and other specialized resources required to enter and support multiple emerging markets simultaneously. In addition, they lack qualified and well-capitalized local in-country "franchisees" to distribute and service their products. And finally, and perhaps most importantly, they do not know where to find these resources themselves or even where to find trusted brokers who can help them with these tasks.

C. Preliminary Agenda

Repairing these broken circuits will entail developing innovative business models and technology deployment mechanisms which can attract financing directly and indirectly from institutional investors and the crowd via newly engineered financial conduits. Fortunately, financial and business model innovators are developing ingenious mechanisms for repairing these broken circuits. In the process, they are potentially setting the stage for new, disruptive rounds of large-scale technology deployment.

GSS 2016 will highlight the innovations taking place in each of these realms and illustrate how these innovations could be scaled-up to reach tens, if not hundreds, of millions of potential customers in the next ten to fifteen years. Speakers will be "thoughtful doers" – women and men with practical, hands-on experience developing **and deploying** these new solutions.

The objective of the Summit is not merely to admire and discuss what others have already done. Instead, by bringing together institutional investors and crowd funding intermediaries, business executives with innovative projects, entrepreneurs with innovative technology deployment models, technology brokers and database builders, NGO and foundation officials, and public officials from around the world, we hope to set the stage for the next round of innovations and technology deployment.

GSS 2016 will address the following topics:

- **Building a better financial plumbing system** to move money from where it is – in the pockets and coffers of pension and sovereign wealth funds, other institutional investors, family funds, impact investors, the crowd, the Diaspora, local communities, etc. – to where it is needed to finance the profitable, commercial deployment of proven technologies that can improve lives and promote sustainable development. The amount of capital currently lodged in these financial conduits is substantial. A 2013 report commissioned by the World Bank predicts that the global crowd funding market could grow to more than $90 billion per year by 2025, nearly twice the size of the global VC industry. In addition, sovereign wealth funds have more than $7.2 trillion of assets under management while pension fund assets under management in the 16 largest markets are more than $36 trillion and the amounts are growing rapidly. If even a small fraction of these assets could be directed to financing technology deployment, it would go a long way toward to

alleviating the $3 trillion annual global infrastructure financing gap estimated by a recent McKinsey study. In an environment defined by low to negative interest rates and disinvestments from fossil fuel-related assets, large institutional investors could benefit from stable long-term returns provided by these alternative investment opportunities.

At a July 2015 meeting in Addis Ababa, Ethiopia, the UN encouraged "long-term institutional investors, such as pension funds and sovereign wealth funds, which manage large pools of capital, to allocate a greater percentage to infrastructure, particularly in developing countries" and the World Bank, IMF and other multi-lateral development banks outlined plans for increasing public and private investment flows for sustainable development from "billions to trillions" of dollars. Fortunately, the private and financial markets have been rising to the challenge. To cite just a few examples: (i) Development Finance Institutions, like IFC, are establishing novel vehicles and mechanism to mobilize billions of dollars from institutional investors to fund innovation and infrastructure; (ii) sovereign wealth funds in Africa are leveraging their capital by establishing private funds specifically tailored to attracting co-investments from university and foundation endowments, as well as other sovereign wealth funds and institutional investors in Africa and elsewhere; (iii) the officially labeled Green Bond market has grown to $118billion of outstandings in less than 10 years (with another $576 billion of "climate aligned bonds" currently outstanding) and growth shows no sign of slowing down; (iv) commercial banks and pension funds are establishing partnerships whereby commercial banks finance the construction and start-up phase of green projects while pension funds provide the long term "take-out finance" after the project's cash flow has been established; (v) new financial instruments are financing portfolios of companies searching for capital to finance their deployment operations; (vi) new platforms are being developed that will allow large numbers of small savers in the crowd and Diaspora to cofinance projects alongside sophisticated institutional investors; (vii) in places like Copenhagen, cooperatives and community trusts enable local residents to invest and own at least a portion of the clean energy and water assets serving their community; and (viii) new financial instruments such as blockchain promise to disrupt the global payments system in ways that will facilitate financial flows.

In addition to establishing conduits for moving capital from one place to another, these financial innovations accomplish several other critically important objectives. For example: They help reduce perceived political risk, for example by having local pension and sovereign wealth funds act as "chaperones" Sherpas, and co-investors alongside other institutional investors. They bundle smaller projects into larger packages that can be financed by pools of institutional investors. They create vehicles that allow institutional investors to finance smaller projects than they would ordinarily finance. And they harness the financial power and wisdom of the crowd and local communities.

At **GSS 2016,** financiers on the frontlines of developing these new financial instruments, investment funds, and funding platforms will discuss the progress that has taken place since the inaugural GSS, explain some of the new instruments, discuss the links between the financial plumbing system and industrial renewal, and give their predictions about what to expect in the years ahead.

- **Business models for technology deployment.** Simply having a good idea or an ingenious invention will not move the world onto a sustainable, low carbon trajectory. Nor will a successful pilot project unless it is scaled up substantially. As Paul Polak notes here and here, technology deployment programs should "aim to transform the lives of 5 million customers within 5 years and 100 million during the first 10." However, as Polak also notes, most enterprises or technology deployment programs fail to set such ambitious goals because, "they don't see a profit in it."

  New financial instruments like the ones discussed above are indispensable for financing these scaling operations. But financial engineering by itself will not get the job done. Emerging markets need to develop the capacity to know precisely what technologies they need and how and where to obtain them – whether via sales, licensing IP, joint ventures, etc. Technology "brokers" need to "curate" matches between innovators selling technology and buyers looking for a specific solution, tailored to local needs, customs, and tastes. New business models, including franchising, need to be cultivated and developed to bring goods and services to tens of millions of customers. And start up weekends, maker fairs, and hackathons need to encourage entrepreneurs to develop innovative businesses based on the deployment of proven technology developed elsewhere. Without this additional focus, entrepreneurs will find themselves reinventing wheels while proven inventions fail to get deployed on the scale required to promote sustainable development and solve global problems. The result is a lose-lose scenario.

  GSS 2016 will address these issues in greater detail and highlight promising innovations in each of these realms.

- **Sustainable urban development.** SDG 11 sets a goal of making "cities and human settlements inclusive, safe, resilient and sustainable." This is a daunting challenge. Over the next 30 years, most of the global population growth, purchasing power growth, economic growth, and growth of urban and peri-urban areas will be in emerging markets, increasing demand for water, energy, food, health care, and climate resilient investment. Not surprisingly, several years ago, UN Secretary General Ban Ki Moon observed, "Our struggle for global sustainability will be won or lost in cities." This is not an exaggeration. Consider the following: The UN Commission on Science and Technology for Development reports that 2008 marked the first time in history that more than half the global population lived in cities. By 2050, however, more than 2/3 of a much larger global population will live in cities. According to the UN's World Urbanization Prospects 2014, 100% of net global population growth between 2015 and 2050 will be in cities. Population growth and urbanization are projected to add 2.5 billion people to the world's urban population by 2050, with nearly 90 per cent of the increase concentrated in Asia and Africa.

  Accommodating this growth in urban population will entail building the equivalent of eight or nine completely new, New York Cities from scratch every year between now and 2050! Or as former Vice President Al Gore and former President of Mexico Felipe Calderon noted at the 2015 World Economic Forum in Davos, Switzerland, "75% of the urban infrastructure that will be in place by 2050 does not yet exist." and more than 60% of the urban areas that will exist in 2030 have yet to be built.

As Mr. Ban Ki Moon noted, these trends will create an enormous opportunity to retrofit older areas with new, state-of-the-art sustainable technology and for new urban areas to bypass older generations of "industrial revolution" urban technology – central power plants, water and waste water treatment plants, etc. -- and leapfrog directly into a sustainable era of smart buildings, smart mobility, smart water, smart health, smart energy, smart waste disposal, and smart services.

Looked at from this perspective, the challenge is simple: How can we organize and finance the financially, ecologically, and socially sustainable deployment at scale of existing, proven, disruptive technologies in both older and newer urban areas? Responding to this challenge will require new business models and specialized financial instruments to support technology deployment. It will also require new information sharing platforms and urban technology deployment demonstration centers so that cities – supported perhaps with program related investments from interested foundations -- can become living technology laboratories, testing and deploying technology on public buildings (schools, hospitals, etc.) and public spaces and learning from each other rather than constantly reinventing wheels that have been tested and proven in other cities. In addition, smart public procurement, by providing a "bankable" source of demand for new solutions can help smooth the way for new financial instruments while simultaneously promoting local entrepreneurship and job creation. The speakers at **GSS 2016** will highlight some of the critical technology deployment initiatives that are taking place under the auspices of the sustainable cities banner. They will also report back from the UN Habitat III Conference that will convene in October 2016 in Quito, Ecuador and the New Urban Agenda that will be discussed and agreed at the Habitat III Conference.

- **More efficient and sustainable corporate supply chains**. Multinational corporations are discovering that "greening" their global supply chains (including transportation systems) and making their retail outlets and domestic headquarters operations more efficient and sustainable is not only good for the environment but it is also smart business, with savings in energy, packaging, materials, waste, and water, for example, going straight to the bottom line. But these corporate efforts have an additional benefit – purchase orders from creditworthy multinationals can also provide a commercially viable source of demand upstream along the supply chain for sustainable technologies. The challenge is to link corporate sustainability programs with some of the new, innovative financial instruments that are rapidly coming online. Speakers at **GSS 2016** will report on some of the interesting new initiatives that are currently underway.

- **Breakthrough Moonshot Technology**. While it is true that the world is awash in existing technology, it is also true that new technologies are coming on line at an accelerating pace. Moreover, such groups as the Breakthrough Energy Coalition are pledging to invest billions of dollars to accelerate research into new "moonshot" technologies that will lead to quantum improvements in energy production, storage and efficiency. Other groups are organizing Grand Challenges and prizes to develop Moonshot technologies in energy as well as other sectors. The deployment of these new moonshot technologies alongside the deployment of existing technologies, in conjunction with the appearance of new financial instruments and business

models to support large scale technology deployment as these new technologies come online holds out the promise of a world of potential abundance.

But as recent political events in various countries shows quite vividly, technological change without both the appearance and reality of inclusiveness can generate political strains as the pace of technological change exceeds the ability of individuals and society to adjust. Tensions ensue, especially but not exclusively in democratic societies, when the promise of abundance encounters forces of popular resistance from people who feel they are not benefitting from the changes. Navigating these difficult currents may prove to be just as difficult and equally important as developing new financial instruments and business models.

- **Snapshot Technology Sessions**. In conjunction with the announcement of the GCCA Award Winners 2016 and the launch of the Global Technology Expo and Deployment Demonstration (GTED2) center in Little Rock, Arkansas, **GSS 2016** will be interspersed with snapshot sessions showcasing innovative, proven technologies available for deployment today. These technologies will cover a wide range of sectors, ranging from renewable energy production and storage, to potable water, to innovative building technologies, to low-cost, high quality health care, among many others.

Registration information along with information about accommodations in Little Rock and a more detailed annotated agenda will be posted in the near future on the home page of the GSS website.

Please contact Alfred Watkins (alfred.watkins07@gmail.com) for further information about **GSS 2016** or if you have any questions about the proposed Agenda or other Summit matters.