

Testimony of Govi Rao

**Chairman, Lighting Science Group
Partner, Pegasus Sustainable Century Merchant Bank**

before the

U.S. House of Representatives

**Select Committee on Energy Independence and
Global Warming**

**Climate for Innovation: Technology and Intellectual
Property in Global Climate Solutions**

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Mr. Chairman, Ranking Member Sensenbrenner and Members of the Committee: I thank you for the opportunity to testify before you today. My name is Govi Rao and I am Chairman of Lighting Science Group Corporation, a U.S based manufacturer of energy efficient and environmentally friendly LED (Light Emitting Diode) Lighting products. We design, develop and manufacture LED products for outdoor area and street lighting, commercial & industrial, retail and architectural applications. Among several award winning innovations, we also designed and built the famous New Years Eve, Times Square Ball and we are also building the next generation streetlight for NYC. We have manufacturing operations in New Jersey, Florida and California.

Also, I am a partner at Pegasus Sustainable Century, a merchant bank established this year by Pegasus Capital Advisors LP (Pegasus), as the market leader in providing capital as well as strategic advice to commercially attractive sustainable businesses primarily in the United States. We do this by providing growth capital and assistance from our experienced team of experts for companies that can secure competitive advantages through resource efficiency. One specific area we focus on is Conservation and Energy Efficiency, investing in innovative U.S. companies with technology and know-how that will help us improve our energy utilization by increasing efficiencies. Our portfolio companies positively contribute to lowering our carbon footprint, with products ranging from highly efficient LED light bulbs to lightweight plastic pallets to re-refined motor oil and converting former coal-fired power plants renewable bio mass. Pegasus is one of the most successful private equity firms in the United States, with a 14 year track record. Pegasus has offices in NY, CT and CA.

My testimony addresses the three questions posed by the Committee:

1. Climate related technologies in developing countries: what business opportunities do you see?
2. Do you see IPR protection as a barrier or a boost to development, deployment and diffusion of climate related technologies at the global level?
3. With a view to international climate negotiations, what are your hopes and fears with regard to spreading clean technologies and also IPR protection?

My experience over the last two years in building Lighting Science as a rapid innovator of LED solutions has been a tremendous learning, especially as it relates to seeking growth opportunities within the U.S and outside as well as in dealing with Intellectual property issues. There are numerous opportunities emerging in the developing countries and I am amazed at the speed of their adoption. I returned last night from Bahrain, and in three days, I was given 13 distinct projects - all relating to technologies affecting climate change positively. Several of these are being driven by the government.

Urgent Need to act on Climate Change

All our past paradigm shifts thus far, from electricity to flight and from man's landing on the moon to the internet, truly pale in comparison to the one we have at hand - global warming and climate change! This seems like the mother of all challenges we have faced thus far as a human race and I strongly believe that we need to act with an increased sense of urgency. Most of the observed increase in average temperatures since the mid 20th century is very likely due to the observed increase in greenhouse gas concentrations resulting from human activity. I personally believe that our current policies and practices will only result in an increase in greenhouse gas emissions over the next few decades, most likely causing further global warming, larger than what we have observed during the 20th century.

I would like to focus this discussion on the opportunities to manage our demand for energy – a direct impact of our legacy infrastructure. Building related emissions of CO₂ account for around 40% of a country's total emissions. Existing buildings – which will comprise the majority of building stock in 2050 and beyond – offer significant opportunities for reducing energy use and hence reducing green house gas emissions. In new buildings the scope is even larger as we start with sustainable design and set targets for zero carbon footprints and include elements like the use of on-site renewable energy.

Global energy demand is increasing at an alarming pace. The International Energy Agency (IAE) predicts that by 2030 the world will need almost 60% more energy than today. Two-thirds of this increase will happen in China, India and other rapidly developing economies. The IEA also estimates this sharp increase in demand would require us to build about 4,800 GW of new

capacity between now and 2030. In addition to this, the industrialized countries face a different but parallel situation. While demand is increasing, the older power plants are reaching the end of their working lives. The IEA predicts that we have to build about 2,000 GW of power generation capacity in the OECD countries over the next 25 years including the replacement of retiring plants.

Recognizing that we can no longer rely predominantly on fossil fuels, policy targets for renewable-based energy have been established in most countries. For example: China (10% by 2010 / 15% by 2020); India (10% by 2012); Brazil (15% by 2020); Mexico (8% by 2012); Philippines (50% by 2020). Renewable energy is becoming an increasingly attractive option for power utilities and energy users. Renewable energy is a massive indigenous source available everywhere, with no geopolitical risk and with no dependence on imported fuels.

While governments around the world are treating renewable sources as part of their mainstream strategy, enabling the competitiveness of these emerging technologies like wind, bio-energy, hydro power, geothermal and solar photo-voltaics, we can surely and swiftly start reducing our energy usage now by leveraging technologies that are available today. Demand side management efforts in existing buildings can easily yield reductions of 30 to 45% in energy usage.

A Clean Energy Blueprint study conducted by the Union of concerned scientists (UCS) found that energy efficiency could reduce our electricity usage in 2020 by about 1,700 KWh, just by improving the energy efficiency in commercial and industrial environments.

The cleanest, safest, most secure, reliable and cost effective kilowatt hour is the one that isn't used!

Several technologies exist today to help us fight global warming. Not surprisingly, a big source of these innovations happens to be the SMEs (small & medium enterprise) – not just in the U.S but worldwide. A great deal of discrete innovation is happening in our country – among entrepreneurs and innovators – in small workshops, in school labs and in garages, literally.

Most of these ideas take a long time to reach commercialization, if the inventor persists through the maze of the process and costs. I see the need for us to act NOW, to work on all fronts of this NEW ENERGY FRONTIER – from renewables to storage, and intelligent controls to energy

efficient devices, appliances and buildings. While the energy crisis is going through an identity crisis of its own, our fundamental processes and policies involving technology and IPR are still mired in the old paradigm. We still work on these things with little to no sense of urgency.

In addition, markets for these energy related products and solutions are opening up world-wide at a reasonably fast pace, driving the decision makers to what is available locally. The green revolution is beginning to take shape slowly and even for those who see the picture painted by Dr. Rajendra Pachauri and his IPCC team, there is generally a huge gap between vision and implementation.

I see a tremendous market for three big ideas globally:

1. Increasing renewable sources, supporting distributed generation and energy storage
2. Aggressively reducing energy usage by using
 - a. intelligent building controls,
 - b. energy efficient and environmentally clean lighting (LEDs)
 - c. Improving HVAC & digital motor controls and
3. Building efficiencies and weatherization

The good news is these technologies exist today. In the U.S. alone, we have numerous SMEs with solutions in hardware, software and integration ideas that can reduce our energy consumption in buildings. The challenge is for us to help the inventors to break the various barriers so they can access markets worldwide – NOW! One such barrier could be the IPR and our current paradigm of handling it.

Besides making the process extremely time consuming and tedious, our current approach to IP is contradictory to the ‘collaborative solution seeking’ mindset we need to solve this global challenge immediately. SME’s seldom have the time or resources to dedicate eons of time to this process. Some do, most don’t. Their ideas rarely make it. Not only has the SME lost the immediate business opportunity, we as global communities have lost one more idea we can build on. In lighting Science, we have spent several million dollars and at least 18 months, wrestling with totally unnecessary IP battles. This valuable money and time applied to technology development and collaboration could have resulted in badly needed energy saving solutions.

IPR now has a dampening effect on the SME community and really has kept us from opening up our full potential as a community of inventors and innovators. If we have to accelerate commercialization of new technologies to contain climate change, our paradigm on IPR will definitely have to change. So what do we do?

I believe there are a few things we could do, to help us build solutions globally to mitigate the effects of climate change, while preserving the opportunity for inventors to gain economically from their IP. The recommendation is to deal with all such patents outside of our 'normal channel'.

- An IP clearinghouse segmented by technologies (e.g. carbon sequestration, wind turbines, etc.) can provide a means for wider access on reasonable terms.
 1. Voluntary participation, but to take, one must contribute.
 2. The clearinghouse would license to the contributed IP on reasonable terms.
 3. Preferably private rather than public, not for profit, not unlike ASCAP and BMI for music copyright administration.
 4. Requires independent panel of technology and IP experts to blindly (with respect to the IP owner and the prospective licensee) set the royalty rate for access to the IP [not statutory rates].
 5. Since the IP rights tend to be national rather than international, can be implemented on a country by country basis.
- Governments can jump-start such a clearinghouse by contributing their own IP (e.g. in the U.S., IP from government sponsored research and the national laboratories).
- Universities may also participate rather than individually pursuing licensing programs.
- Part of the proceeds might be used to support patenting for individual and small inventors.
- Need not be confined to patent rights -- could also be early and full sharing of know-how.
- Market principles should be kept in mind -- the idea is to remove some of the barriers to downstream access, but not remove the incentives for innovation and IP. [Imagine if all the money spent in stent or cell phone or blackberry patent fighting was instead used for further development or deployment].

- The clearinghouse would level the playing field with respect to access and IP licensing cost, remove distracting litigation, but still reward IP commensurate with value.
- Participants may emphasize their participation in the clearinghouse with a certification trademark -- it would designate that they recognize that the problem is big, that the solution is needed as soon as possible, and that they will not let their IP rights slow further development or deployment by others.

Breaking down geographic barriers and building global communities of Innovation among SME's will enable us to generate more meaningful solutions faster.

Such an exchange with basic arbitrage built in, will also enable SMEs to access markets in other parts of the world, where they would not normally be focused on. This will also encourage cross pollination of ideas and enable inventors to build better mousetraps, faster.

With respect to the upcoming international negotiations, and specifically addressing the spreading of climate change technologies, I am concerned about the time it will take to reach consensus for any collaborative effort given our current approach – of protecting IP along geographic boundaries. Most conversations at a global level, approach this from a protectionist framework. Enabling market forces of demand and supply to play out globally, and enabling technology inventors to collaborate more openly, is imperative for us to rapidly spread appropriate technologies worldwide. This change in approach will have to begin with a shift in how we look at IPR in this environment of such a massive global challenge.

Perhaps our resolve and willingness to set meaningful targets for emission reduction could influence how we can drive a more collaborative approach in Copenhagen. Such forward thinking discussions combined with proposals to enable rapid innovation across boundaries can be a great mechanism for us to spur innovation and rekindle the economy. I am afraid we will shy away as a global community, from making bold decisions, when anything less will leave us far short of what is required. I'll be happy to answer any questions you may have.

Summary of Key Points in the testimony:

- Urgent need to act on climate change – as a global community
- We have to break down barriers between sectors and countries – collaborative approaches are going to be key. Tackling climate change has to go beyond geographic boundaries and “business as usual” mindset
- There are tremendous business opportunities to take our ideas to emerging economies like BRICA and the Middle East. Opportunities also exist for Small and Medium enterprises (SME’s) to create new markets around the world – specifically in areas of energy generation, distribution and application.
 1. The developing economies around the world, for a long time now, have been battling an increasing gap between demand and supply of energy. They are viewing the renewable sources as a great opportunity to bridge that gap and are planning to do it with greater sense of eco-responsibility
 2. Countries in the middle east are redrawing their energy roadmaps and are paying very close attention to usage, not only energy generation
 3. All this activity is generating a rapidly growing interest in new products and new solutions
 4. Governments in these countries are strongly encouraging conversion to energy efficient technologies/solutions – creating markets for the right solutions
- While markets are being created locally in these countries, there is little technology flow or collaborative approach to the climate change challenge
- Among other barriers, I believe our current paradigm on IP renders it more of a barrier and is limiting the flow of technology across geographic boundaries and is seriously slowing down our ability to get to creative solutions
- I personally believe an extension of IP sharing and collaborative innovation can lead to effective solutions faster
- Businesses need assurances of IP protection to justify investment in technology
Businesses also need assurance of freedom to operate [infringement actions] and at reasonable cost [reasonable royalties]

So what's the solution?

Governments can enable collaborative innovation to battle climate change; one possibility is to create an 'IP bazaar/clearing house' for all technologies contributing to reduction of GHG emissions. Creation of an open innovation platform, supported by a 'global fund' to ensure value flow to the inventors and innovators, will foster cross discipline and cross geography collaboration more freely, thus building the ability for innovators around the world to connect in pursuit of solutions towards fighting climate change.

- One possibility is to create an 'IP bazaar' or an 'Global IP Xchange' for all technologies contributing to reduction of GHG emissions, climate change technology (CCT). This exchange will be a clearing house for all patents relating to CCT.
- Potentially all inventors would submit their patent ideas to this exchange and also search the exchange for other patents to build on and license from.
- It would also be smart to create a fund to finance patenting, cross licensing as well as providing basic economic assistance to all valid innovations.
- The clearinghouse could also have a certification trademark, for example like energy star or good housekeeping. The idea being that if you contribute to the clearinghouse, you get to use the certification mark which shows that you are putting the good of the planet over personal gain without conscience.

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