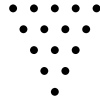


FairConditioning



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Lets Cool Down
THE FAIR WAY 

The iFlair conditioning campaign was created by a confluence of consumers and associations protecting the planet's climate. Our program aims at reducing bills and greenhouse gas emissions from the indoor cooling sector.

*f*AIR CONDITIONING
to learn more visit www.fairconditioning.org



Editor's Note: Changemakers in Sustainability

Sustainability changemakers are individuals who are using creativity and innovation to solve issues at the nexus of society and the environment. They are intrinsically motivated and typically have personal experiences with the challenges that they are engaged with, but are committed to not just individual betterment but betterment for the greater good. Changemakers are everywhere, even if they may not recognize themselves as such. Ashoka, the world's largest network of social entrepreneurs, defines changemakers as those who are:

1. Intentional about solving a social problem. They have empathy for others and are driven by a genuine desire to make the world a better place.
2. Motivated to act. They give themselves permission to explore what they can do about a specific social problem and work tirelessly until they have made an impact.
3. Creative. They are inquisitive, open-minded, and resourceful. They have the courage to view and do differently than the status quo.

Other important attributes of changemakers is that they are generally an “insider” or trusted person within a community. Changemakers are not people who drop in for a period of time to bring in expertise, funds, or an intervention. They have a personal connection to both the issue and the people and show up in authentic ways. Additionally, changemakers don't fit any certain archetype when it comes to age, political stance, educational background, race, gender, etc.

This edition follows Vivek Gilani, Director of cBalance and creator of the FairConditioning program. Gilani is the epitome of a sustainability changemaker, demonstrating all of the above qualities of a paradigm-shifter which will be highlighted throughout a suite of examples in this report.



A WARMING PLANET: THE NEED FOR FAIRCONDITIONING

Around the world there has been a rising demand in air conditioning driven by increases in temperature due to global warming, population growth and rising income in developing countries. However, this shift in consumer demand is creating an even larger problem with global climate change as well as the resilience and adaptability for people in warming regions. The problem with air-conditioning comes from two sources: the amount of energy used, much of which is still powered by carbon-emitting coal, oil and gas generation, and the leaking of hydrofluorocarbon (HFC) coolants, which are short-lived climate pollutants many times more potent than carbon dioxide. Additionally, as individuals around the world grow accustomed to air conditioning as commodities, their ability to adapt to continuing changes in climate becomes more of a challenge.

When considering a country like India, which is one of the fastest growing major economies in the world, it is important to recognize the major impacts that will come with market demand for air conditioning and cooling needs. Given India's rising middle class, the expansion of its electricity grid, and increasing temperatures in an already hot and humid climate, the use of room AC units in India has been rising exponentially in recent years and has become the number one luxury purchase. The stock of room ACs has skyrocketed from four million units in 2014 to approximately 30 million in 2017, with 2017 AC sales at around 5.5 million units. Additionally, projections for air conditioning continue to rise, with an installed stock of between 55 and 124 million units by 2030. Therefore, with demand comes a need for a shift in mindset, policy and technology.

The FairConditioning program in India was established with a focus on evidence-based policy support in creating a sustainable cooling ecosystem, by working with stakeholders across academic, professional, and corporate levels to achieve systemic behavior change. As an organization focused on energy demand management, the program aims to achieve indoor thermal comfort while reducing or eliminating conventional air conditioning in tropical climates. The main approach of the program is to improve energy efficiency, integrate energy efficient technologies and influence corporate consumer behavior through a holistic approach. The FairConditioning program aspired to be so integrated into the Indian consumer and architectural framework that even policy changes overtime will not undermine this effort or foundational approaches to education, technological advances, efficiency and behavioral change. The collaborative efforts to create a more sustainable and energy efficient system will continue as FairConditioning stakeholders develop strategies for a more equitable future for India.





Meet The Key Actors: FairConditioning - a Collaborative Effort

With a system as complex as an entire country's desire for air conditioning, solutions may seem unattainable at first glance. Wicked problems require working across boundaries with a wide variety of actors and stakeholders. Direction, alignment, and commitment is mission-critical and that's just what Vivek Gilani and his company, cBalance, brings to the FairConditioning program. Vivek is a changemaker. He is a social entrepreneur with an intense passion for championing new and innovative ideas that transform society's systems, thereby improving the lives of millions. When you hear him talk about FairConditioning there is no doubt that he is both personally and professionally compelled towards achieving a dramatic shift towards a sustainable future for India. His passion is magnetic and this energy undoubtedly translates to inspiration within his inner working circles. Vivek is perhaps the most crucial actor in the entirety of FairConditioning. He recognized a problem that needed systemic change and understood that he would need to get a diverse set of actors aligned and working towards a common goal. Although each of the following actor groups have individual motivations, it seems probable that Vivek's infectious charisma has affected all parties and inspired them to see the value that these outcomes can have in their own work. Specifically to lower carbon emissions in India and create a more sustainable and equitable society.

The design concepts and technology to create more efficient cooling systems have already been developed, but in order to get them manufactured and out into the world Vivek needed to get engineers and manufacturers on board. They fall into the first key group of actors, private firms and businesses. Real estate developers and contractors also fall into this category. These actors seek to drive technology and innovation forward. Their motivation for the success of FairConditioning comes from its potential to create a significant increase in the job opportunities for their respective fields.

Getting the private sector on board is a big deal, but now comes the need for a whole new workforce and knowledge set to build these sustainable cooling technologies. Therefore, the next key group of actors is that of universities, professional societies, and NGOs. They provide the ability for an increased spread of knowledge, communication and networking opportunities, and a highly trained workforce. The primary outcomes this actor group hopes to achieve are that of creating a more interconnected knowledge sharing network and assisting in the production of sustainable and equitable housing and HVAC systems.

Financing and implementing this program is yet another apparent critical point that brings us to the final group of actors, the government and investors. Quite a few governmental organizations as well as private funders provided the capital required for this large-scale project. It's likely that all of these actors were at least partially motivated by the potential return on investment. A few of them, however, had motivations related to creating economic growth and stability in India.

With all of these actors on board, the FairConditioning program has a fighting chance at creating an enduring, sustainable future for the people of India.



SHORT-TERM
OUTCOMES

Architecture and engineering professors are trained in sustainable and climate-responsive design pedagogy.

Students get certified in sustainable design approaches.

Architects will learn passive building design and building-energy modeling software.

Office managers will up their thermostats by two degrees and modify their corporate dress policies.

Implementation of retrofitting projects of participating businesses.

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Architecture and engineering sustainable and climate-responsive pedagogy within their reg

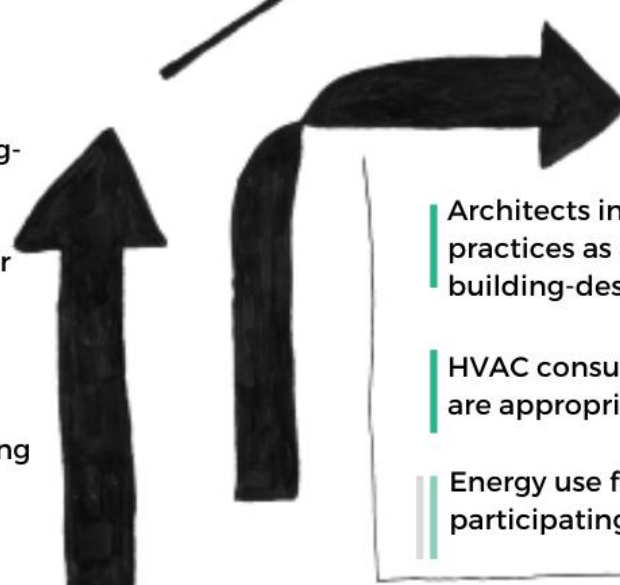
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HVAC consultant design s
are appropriate for project

Energy use from HVAC sys
participating businesses.



FAIRCONDITIONING

Theory of Change

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ACIP - Academic Curricula
Integration Project

PESP - Profes
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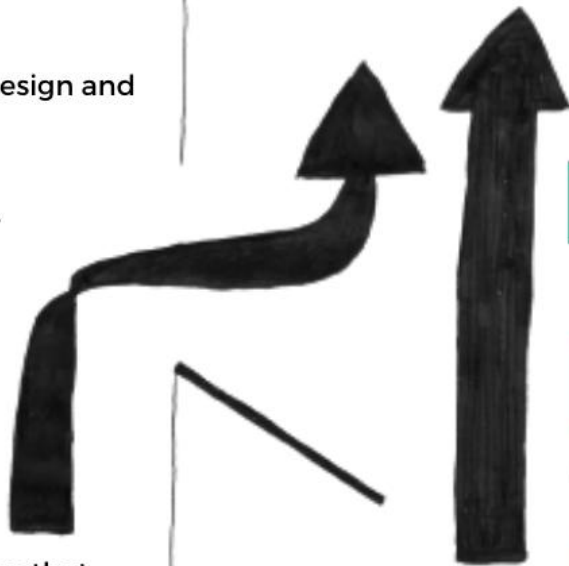
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Sustainable and climate-responsive design is integrated into university architecture curriculum.

New buildings in India reduce energy consumption and achieve sustainability certifications.

Influential businesses use blueprints as a model for future construction projects and set the bar for competitors.

Adoption of UpBy2 is normalized across corporate India and reduces energy consumption by 20%.

GHG emissions associated with cooling in building is reduced

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Academic Curricula Integration Project

Improving Efficiency through Education and Knowledge Dissemination

Having identified universities as unique stakeholders in a position to change how future engineers and architects view air conditioning in the country, cBalance launched the Academic Curricula Integration Project (ACIP) with the goal of implementing techniques of efficient building design and sustainable cooling technology into the core curricula of architecture and engineering universities. Partnering directly with universities provides cBalance with the opportunity to include sustainable cooling technology and efficient building design ideas into the entire 5-year program of these schools, involving 'integrative' curricula change instead of 'additive' curricula change.



“The program envisages a pedagogy in architecture and engineering where sustainability considerations are at par with space and structural considerations in building and cooling design thinking and execution”

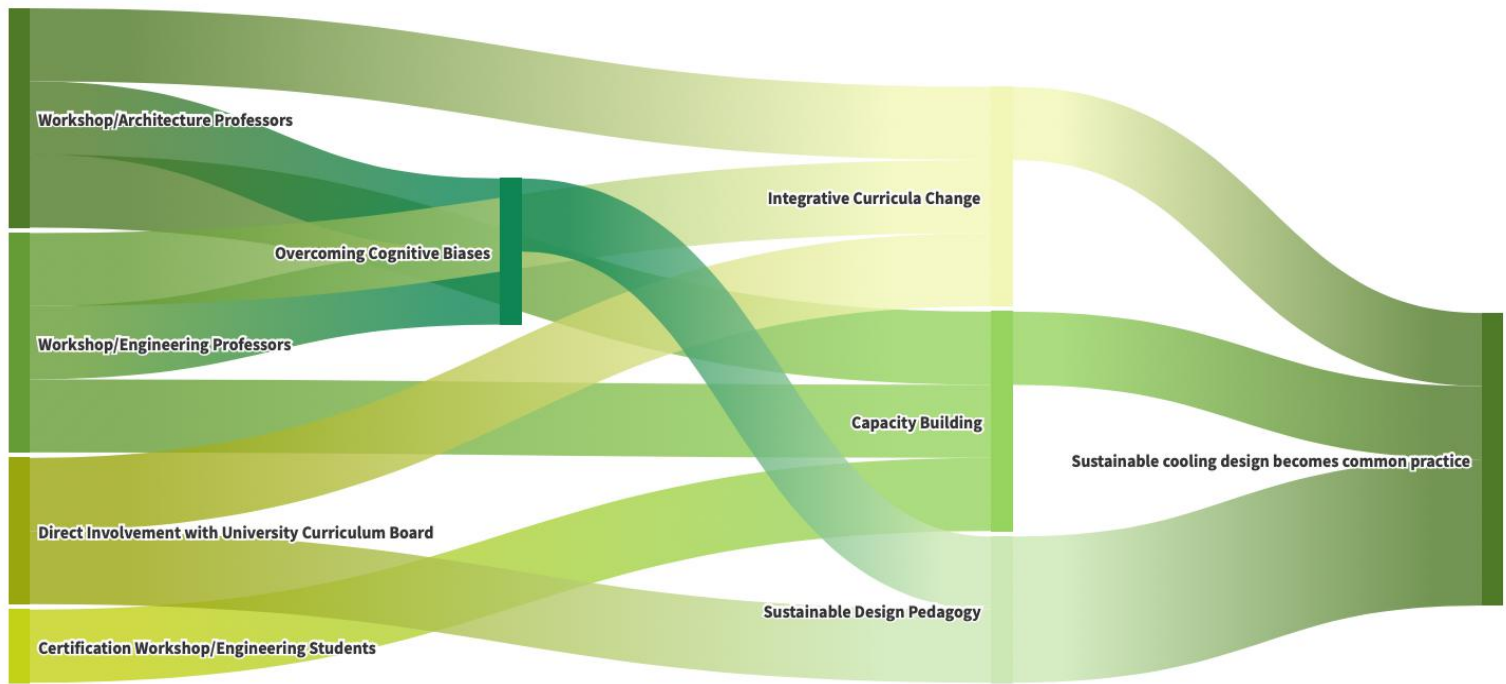
But Vivek realized this is easier said than done. Professors are often unwilling to move away from traditional curriculum if they are not empathetic to the cause. With this in mind, he integrated a change-management program into ACIP that is designed to tackle behavior change and the cognitive biases of professors who might resist changes to the existing pedagogy. Cognitive change best comes when the teachers are able to relate to the social and ecological injustices of conventional air-conditioning in the country. When they understand the negative impacts of keeping curriculum at the status-quo, their willingness to integrate efficient building design and sustainable cooling technology into the core curricula of their courses increases.

cBalance does recognize that professors are not the only ones they need to reach out to if they want to achieve their goal of 'integrative' curriculum change. They must also approach the university's Board of Studies which determines the academic curricula. cBalance hopes that if they can get these curricula-integration strategies adopted into eight of the most prominent universities in India, this will influence the Indian Bureau of Energy Efficiency (BEE) to include Building Energy Use Conservations related materials in undergraduate curriculum for all universities.

Another path to integrating sustainable cooling pedagogy into universities is through formal integration of these techniques into the professional development requirements that are determined by All India Council of Technical Education (AICTE) and Council of Architecture (COA). These organizations certify and grant operating licenses to academic institutes in India. If cBalance can integrate techniques of efficient building design and sustainable cooling technology into their professional development requirements, then integrative curriculum change is sure to happen.

The FairConditioning program incorporates three workshops to disseminate sustainable cooling knowledge to the academic sector:

- Training of Trainers (TOT) Workshop for Architecture Professors
- Training of Trainers (TOT) Workshop for Engineering Professors
- Certification Workshop for Engineering Students



Visualization: Trisha Porter

Training of Trainers Workshop for Architecture Professors and Training of Trainers Workshop for Engineering Professors

The concept of “Benchmark Energy Performance Index” values has been established through the Energy Conservation Building Code (ECBC) and the Bureau of Energy Efficiency (BEE) Commercial Building Energy Performance Benchmarking Program, however, due to lack of awareness, skilled-capacity, and insufficient enforcement of the codes, these concepts have yet to transform energy consumption in India. These 4-day workshops aim to build capacity within India’s architecture and engineering colleges through integrative curriculum changes with the hope that sustainability will be legitimized and centralized as an equal third axis to structure and space in the building design process.

Certification Workshop for Engineering Students

This 5-day program is co-organized with universities and colleges to impart efficient cooling techniques, such as radiant cooling, evaporative cooling (direct and indirect), vapor absorption, and natural refrigerant based cooling, for Civil and Mechanical Engineering programs.

Working with numerous service providers, industry associations, & advocacy groups, cBalance also aims to incorporate their workshops into the training programs of these partners, further disseminating sustainable cooling technology education to the architects and engineers of India. For example, FairConditioning and the Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) are collaborating together for mutual benefit.

- Upon successful completion of FairConditioning’s ACIP Engineering Student Certification, students and their colleges receive a free license (one-year) to use ISHRAE’s ‘Smart Energy’ tool.
- FairConditioning’s student certification programs will also be available through ISHRAE’s Student Chapter to Mechanical Engineering students in selected program cities.
- Additionally, FairConditioning and ISHRAE are co-creating a five-day program on Building Physics, Passive Cooling Strategies & Sustainable Cooling Technology Modeling for Practicing Engineers. This program will also be included in the four-month diploma offered by ISHRAE.



Image: Daria Sannikova

Core Changemaking Strategy: Building Trust

Above all else, building trust was key to the success of the Academic Curricula Integration Project. Vivek and his team recognized that creating products for educators was not as effective as creating them with educators. The lesson plan design model harnessed the expertise of both parties and enabled a shared understanding and a shared vision for implementation. They consider many of their products as process pieces, meaning that they are regularly being updated, refined, and improved on with the expertise learned from their partners. Before even engaging in the design of lessons, cBalance held a series of consultation sessions to understand the landscape of higher education and to hear some of the opportunities that were identified by professors and deans. It was essential that FairConditioning was seen as not something "extra" within curriculum, but a means to address the preexisting academic goals. The commitment to active listening and incorporating the perspectives of these stakeholders as experts was critical to building trust and enabled a successful role out of the ACIP at a variety of institutions.

Vivek also is quick to recognize the strengths and the weaknesses of his team - cBalance is not made up of scientists per se, none of them have doctorate degrees in HVAC - but they have identified a critical niche for driving change. And if they can do this as "non-specialists" then certainly specialists like architects and HVAC manufacturers have even more opportunity. They share this vision and perspective during their workshops which motivates both faculty and students to see how they can lead from where they are to make a significant impact in their work. Initially lined up to be a train-the-trainer, the ACIP became more than just providing curriculum to faculty and stepping out of the picture. Vivek saw the need to shift approaches from wide-and-shallow to deep-and-narrow. The relationships that resulted provided fertile grounds for case studies that could then be shared out across other universities. Additionally, Vivek and his team saw an opportunity to build not only trust in the faculty but within students too - when this occurred he witnessed students bringing an activism component that he hadn't initially planned for, where the new wave of practitioners were demanding change and celebrating this new approach to architecture and manufacturing. Trust and inspiration spawns further innovation.

Within the academic community, the team also established trust by demonstrating that this curriculum work was not a money-making business, but an enterprise for addressing an issue that was personally and professionally significant to members of the FairConditioning program. Their transparency in the process, including ensuring that all of the developed resources are in the commons and widely available reinforces that justice-focused goal.

Lastly, Vivek is committed to creating an organizational culture that is representative of the values and big-picture goals they are working towards. For example, in the workshops that they host, their team travels by train (not airplane), use public transportation whenever possible, and refuse exploitative labor in the making or serving of meals. In these subtle ways they are committed to challenging the norms and demonstrating that change is possible to their participants.

Changes to the System

The heart of the challenge that India is facing with air conditioning is the positive feedback loop it creates between the use of air conditioning, its energy requirement from fossil fuel sources, and the emissions pollution from both that is contributed to the environment to perpetuate climate change. Reversing that cycle is the pinnacle of Vivek's journey with FairConditioning. Among the many feedback loops within the system, it comes as no surprise that a changemaker would identify points of leverage that will lead to fundamental, lasting change. After seeing the Government of India fall short in addressing this issue through policy with their ICAP and ECBC, Vivek engages centers of influence such as universities, professional societies, NGOs, and private businesses to intercede in how architects and engineers are educated and rebuild the foundation of how cooling is developed within the prospering Indian society. ACIP, SCAN, PESP, and UpBy2 encapsulate the direction, alignment, and commitment that will unite these stakeholders to adopt sustainable practices and reduce greenhouse gas emissions.

ACIP recognizes the power that education and information have within the air conditioning system making it a considerable leverage point. Reforming the way engineers and architects learn about their craft so that priority is placed on sustainable practices has laid a foundation for how the additional 70% of buildings will be designed and built. Through this program, energy efficiency is at the core of the development feedback loop to create positive momentum towards future green building development. Adding sustainable building design and cooling technology into core curricula of architecture and engineering universities has allowed cBalance to use information and behavior change to supplant business as usual practices of influential stakeholders, leading them toward future sustainable development. Earning the trust and buy-in from university change makers such as Professors and Boards of Study has proven a difficult feat, but successfully doing so will benefit other parts of the system outside of the ACIP feedback loop, such as gaining support from government agencies like the Indian Bureau of Energy Efficiency. Investing funds and resources into ACIP offers a strategy for near-term and long-term influence with the ability to positively affect interconnected feedback loops within the system.

PESP takes the education approach with a different, but equally as influential, stakeholder in HVAC consultants and architects. Engaging these professions now offers immediate change within the same system. SCAN plays a similar role, but from a different position within the loop. By overcoming the misinformation associated with sustainable cooling technologies through education, the program influences today's developers to make better decisions through education and audits.

Vivek's fourth project addresses an entirely different feedback loop that is much more difficult to alter. UpBy2 promotes policies aimed at changing consumer behavior. Ambassadors that adopt FairConditionings recommendations for policy are reducing the output of the positive consumer feedback loop by changing the way they use cooling technology. By reducing use overall, they are reducing the influence air conditioning has within the system as a whole. Immediately eliminating its use would shift the loop to the negative but that is an impossible ask. Instead, reducing its use in the meantime until more sustainable solutions are deployed has provided leverage within the system to reduce the output of greenhouse gases.



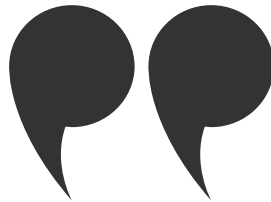
Druk White Lotus School in Shey uses building orientation and glazing to provide passive energy and maximize the solar potential in the high-altitude climate



Indira Paryavaran Bhavan (IPB) in Delhi uses a combination of building design techniques to reduce the need for traditional air conditioning, including passive cooling, a chilled beam system for active cooling, and building materials designed for insulation and heat reflection

From Vivek to YOU: Advice for Changemakers

Leading from where you are requires that one understands where they can make change within the system from where ever they may sit - be it as a founder of a company, a volunteer board member, or a middle school student. Changemakers from all backgrounds and experiences are critical for addressing the sustainability challenges that we face as citizens of the world. When asked what advice he would have to an aspiring changemaker, Vivek shared wisdom from his own personal path noting that,



I latched onto things and pathways that made sense to me, that felt aligned with peace, non-violence, justice, and beauty... and tried to-try to hang onto them as long as possible without questioning them too much."

That sort of very personal sense-making of both the challenges and opportunities is perhaps one of the first steps to making waves in this work. Only after the personal connection is made does the technical and material experience come to bear. It's clear from Vivek's work with FairConditioning, as well as other initiatives that he's engaged with historically, that staying true to his core values has also played an important role in his development as an agent of change. Lastly, he shares that once those pathways and solutions are identified that they should be celebrated in a real sense, describing them as "precious" and "what support life."

As YOU take your next steps, perhaps now more intentionally, as a changemaker in your own circumstance consider the following:

What is your personal connection to sustainability issues and solutions?

What are your core values?

How are you celebrating both small and large solutions?



VIVEK GILANI
Director, cBalance
sustainability changemaker

3SO

f AIR CONDITIONING



Stakeholders

Reimagining and restructuring the way an entire nation thinks about and approaches a system as complex as air conditioning is a massive undertaking. It is essential that there is intimate collaboration among a highly diverse set of stakeholders in order for the FairConditioning program to find success. The stakeholders involved in this program range from the academic and governmental sectors to the professional and corporate worlds and everything in between. Rather than addressing each individual stakeholder, this analysis will discuss the key stakeholder groups and the big players involved in each of them.

The most crucial stakeholder in the entirety of the FairConditioning program is cBalance, for without them this program would never have been manifested. More specifically Vivek Gilani, the managing director at cBalance, who created and spearheaded the program. Seeing as cBalance is the progenitor of the program, they have a high interest and influence in the success and implementation of it. Through the development of a transparent carbon footprinting database and a reframing of the narrative around air conditioning in India, cBalance hopes to create a framework that supports green building development and a sustainable cooling system for current and future generations.

Private firms and businesses are the first main stakeholder group that will be examined. This group includes architects, HVAC engineers, AC manufacturers, real estate developers, contractors, and technology adopters. Overall, the former three have higher interest and influence than the latter three, so they will be the main focus for this group. Through collaboration with cBalance as well as several Indian Universities and a utilization of the ACIP (described in detail in the strategies section), architects and engineers alike are learning and disseminating new information and designs for creating sustainable cooling technologies. Without them on board the technology required to achieve success with the FairConditioning program would not exist. Thankfully, cBalance has created a sense of direction, alignment, and commitment amongst these stakeholders giving them a sense of purpose. On top of the positive impact this will have on GHG emissions, these stakeholders will also see a significant increase in job opportunities in their respective fields. As for real estate developers and contractors, their interest is lower, but they still maintain high influence due to their ability to acquire and leverage existing capital resources. Their interest could rise, however, once they start seeing the efficacy of financial return.

The next stakeholder group, which consists of universities, professional societies, and NGOs, covers a seemingly diverse set of stakeholders. Where they share commonalities is in their influence types and interests. They all maintain medium to high interest as well as high influence across the board. Their influence type generally revolves around bringing large groups of people together and sharing knowledge and information among them. The universities' role in this is nothing short of pivotal. At 120 Indian colleges there are 730 architect professors who are trained in sustainable building design pedagogy. As far as engineering goes, there are over 1400 HVAC students at 24 colleges who are certified in both heat load calculation and sustainable HVAC system modelling. Without these universities implementing these programs, the HVAC and architecture industries would have no prospective candidates to hire who could actually build and understand these sustainable cooling technologies. Professional societies such as ISHRAE (Indian Society of Heating, Refrigeration, and Air Conditioning Engineers) and the Indian Green Building Council have a similar approach to the universities, but with more of a focus on network-building. ISHRAE connects over 28,000 HVAC professionals and enables them to advance and educate themselves through workshops and lectures while also providing career guidance and financial assistance for students and young professionals. This organization also provides a venue for networking opportunities and enables members to have continued education after college, allowing them to stay relevant in their field. There are professional societies for both architects (Indian Institute of Architects) and developers (Confederation of Real Estate Developers' Associations of India) that play similarly important roles. The Indian Green Building Council, on the other hand, works to create a network between government, industry, and civil society through advisory and consultative processes. They support efficient cross-sector communication and collaboration. The spread of ideas and knowledge would be far more challenging without these societies in place. Noe21 is the main NGO operating within FairConditioning. They actually worked directly with cBalance to develop the program. They support the universities in changing the architecture schools' curricula and help raise awareness among consumers and stakeholders. The strategies they have used have fostered new research and development opportunities.

Government and financiers are the penultimate stakeholder group that will be addressed in this analysis, followed by the general public which consists of homeowners and renters. A few of the governmental organizations also doubled as financiers. Almost all of these stakeholders have high interest in and influence on the FairConditioning program. The high influence is due to the fact that without them there would be no money to fund this large-scale project. Some of the financial institutions as well as Energy Service Companies (ESCO) interests' stem from the potential return on investment. Other institutions, however, have interests related to economic growth and stability. USAID, for example, is hoping to support economic prosperity and strengthen India's energy security. The Ministry of Environment, Forest, and Climate Change seeks a boost in domestic production. They were the ones to launch the India Cooling Action Plan (ICAP) and also oversee policy and enforce standards. The Oak Foundation, a private funder, cares deeply about creating a sustainable future and supports projects that aim to equitably address environmental issues. The International Solidarity Bureau of the State of Geneva is another governmental organization providing funding in hopes of strengthening international commitments. Though the reason for their interests may vary, these stakeholders are all incredibly significant and influential on the success of FairConditioning.

As for the homeowners and renters, their interest at this phase of the program is seemingly low, and their influence is medium. The fact that there is any interest from consumers at all likely stems from the potential for them to have more cost efficient cooling in the future, as well as a decrease in health risks associated with carbon emissions. Interest is likely to rise in conjunction with increasingly lower cooling costs as the new technology associated with FairConditioning becomes widely available and implemented. The biggest challenge that comes with this stakeholder group is education and behavioral change. The public needs to be educated on all of the benefits of this program and there also needs to be a shift in how they think about and use AC units. Owning one is a key status symbol in India and many of those who do own one will use it indiscriminately; even when they would be more comfortable with it turned off. Attempting to change the way an entire culture views something like air conditioning is a daunting task. FairConditioning is fully aware of this challenge and has programs in place and a vast knowledge database to tackle it head on.



Strategies

The FairConditioning program is organized into four unique projects with the purpose of engaging key stakeholders identified as having a high influence on energy efficiency gains, each project targeting a different part of the system that needs change.

Academic Curricula Integration Project (ACIP) focuses on education and knowledge dissemination
 Professional Ecosystem Support Project (PESP) focuses on capacity building
 Sustainable Cooling Adopters Network (SCAN) focuses on corporate technology adoption
 Corporate Thermal Comfort Policies Campaign Project (UpBy2) focuses on corporate behavior change

In addition to these four projects, there are a handful of other approaches that the FairConditioning project is employing that are critical for success:

1. Governance, Policies, and Regulations

cBalance is not taking a lead role in actively shaping policy and energy conservation building codes. Rather, they are supporting this strategy and allowing advocacy organizations, such as NRDC, to handle this effort. In addition, the Government of India has launched two programs aimed to address this issue.

The Ministry of Environment, Forest, and Climate Change Strategies (MoEFCC), Government of India, launched the India Cooling Action Plan (ICAP) in 2019 as a 20-year roadmap to address cooling. MoEFCC's primary concerns are implementation of policies and programs relating to conservation of the country's natural resources.

The Bureau of Energy Efficiency (BEE), Government of India, Ministry of Power, launched the Energy Conservation Building Code (ECBC) 2017 on June 19, 2017. The ECBC provides minimum requirements for the energy-efficient design and construction of buildings. In addition, the Code offers two sets of incremental requirements to attain enhanced levels of energy efficiency.

The Natural Resources Defense Council (NRDC) uses an array of policy tools in the United States and key countries around the world to advocate for deep cuts to carbon pollution.

2. Improving Efficiency through Education and Knowledge Dissemination

The Academia Curricula Integration Project (ACIP) aims to implement techniques of sustainable architecture and cooling technology into the core curricula of architecture and engineering colleges and universities, ensuring graduates are taught that energy efficiency is a national and global priority. One goal of the project is to get Building Energy Use Conservation related materials included in undergraduate academic curricula. FairConditioning has designed three workshops to disseminate sustainable cooling knowledge to the academic sector:

Training of Trainers (TOT) Workshop for Architecture Professors
 Certification Workshop for Engineering Students
 Training of Trainers (TOT) Workshop for Engineering Professors

Working with numerous service providers, industry associations, & advocacy groups, FairConditioning aims to incorporate their workshops into the training programs of these partners, further disseminating sustainable cooling technology education to the architects and engineers of India. For example, FairConditioning and the Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) are collaborating together for mutual benefit.

Upon successful completion of FairConditioning's ACIP Engineering Student Certification, students and their colleges receive a free license (one-year) to use ISHRAE's 'Smart Energy' tool.

FairConditioning's student certification programs will also be available through ISHRAE's Student Chapter to Mechanical Engineering students in selected program cities.

Additionally, FairConditioning and ISHRAE are co-creating a five-day program on Building Physics, Passive Cooling Strategies & Sustainable Cooling Technology Modeling for Practicing Engineers. This program will also be included in the four-month diploma offered by ISHRAE.

3. Finance

Multiple organizations are supporting FairConditioning through finance investment strategies. These organizations include, but are not limited to:

The Oak Foundation

The International Solidarity Bureau of the State of Geneva

USAID (funded the 2nd phase of the program, specifically the PESP, SCAN, and UpBy2 programs) - one thing to note here is that although these funds have been approved, they have not been dispersed since the 2016 elections therefore the PESP, SCAN, and UpBy2 programs are dormant until the funds are released.

New Delhi (funded the 2nd phase of the program, specifically the ACIP program)

Shakti Sustainable Energy Foundation (funded 2nd phase of the program)

4. Influencing Behavior Change

The Corporate Thermal Comfort Policies Campaign (UPBy2) encourages large corporations, industry associations, and policy advocacy bodies to establish policies around AC thermostat settings and workplace dress code to enable corporate offices to operate at 28°C (82.4°F), reducing energy consumption by up to 20% at no capital cost.

Ambassadors for behavior change promote sustainable cooling technology through early adoption of these practices. Through voluntary adoption, highly regarded first-movers are recruited to implement sustainable cooling practices, consequently inspiring their peers to do the same. Consumer and industry ambassadors promote organizations that can influence public opinion on environmental and climate change issues.

5. Leadership Strategies

Storytelling and reframing air conditioning in India: through the FairConditioning program, cBalance is creating a new story for India; one that recognizes that traditional air-conditioning technology and practice is not well suited for the Indian context.

6. Integrating Technological Innovation and Adoption

Through the Sustainable Cooling Adopters Network (SCAN) program, cBalance seeks to correct the misinformation around sustainable cooling technologies. Too often, these technologies are seen as inferior or too costly as compared to traditional air conditioning technology. Through an HVAC-system energy audit, a Technical Feasibility Report outlines the energy/cost/GHG emissions reduction from implementation of one or more of the following sustainable cooling technology options:

R-290 Split Unit ACs

Direct/Indirect Evaporative Cooling

Passive (Structure) and Active Radiant Cooling

Solar Vapour Absorption Machines

Passive Cooling Technologies

Additionally, SCAN seeks to address misinformation amongst large buyers and opinion-moulders through their procurement and purchasing practices. These cooling-solutions customers can change and shape the procurement and purchasing practices of others.

7. Providing Support and Knowledge to professional Architects and HVAC Engineers

The Professional Ecosystem Support Project (PESP) provides comprehensive sustainable cooling knowledge, tool, and design process support to professional HVAC consultants and architects. By providing this much-needed support, FairConditioning hopes that sustainable cooling technologies and energy efficiency will become embedded in common building practices in India instead of for pliant and interested 'clients' only. Two workshops are offered as part of this program:

Building Energy Modeling Advisory Workshop for Professional Architects

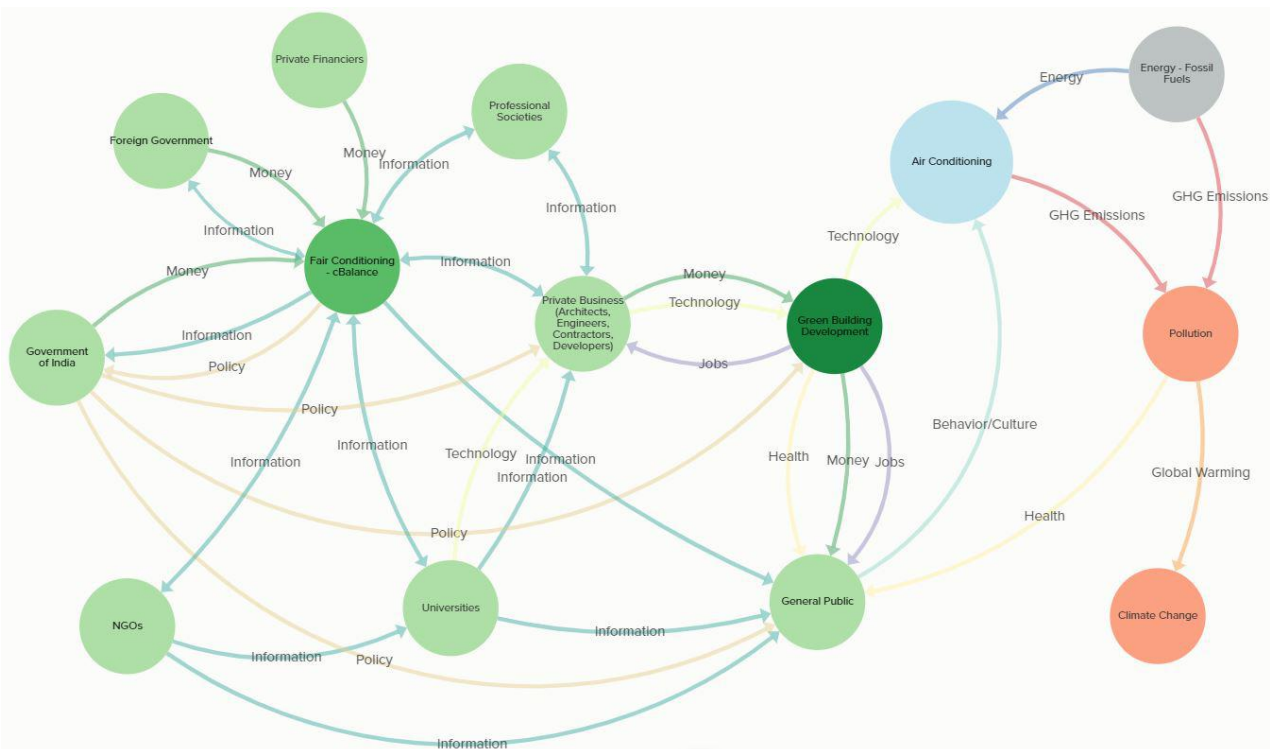
Round-table Discussion for Architects, HVAC Consultants, Professors and their Stakeholders from Real Estate

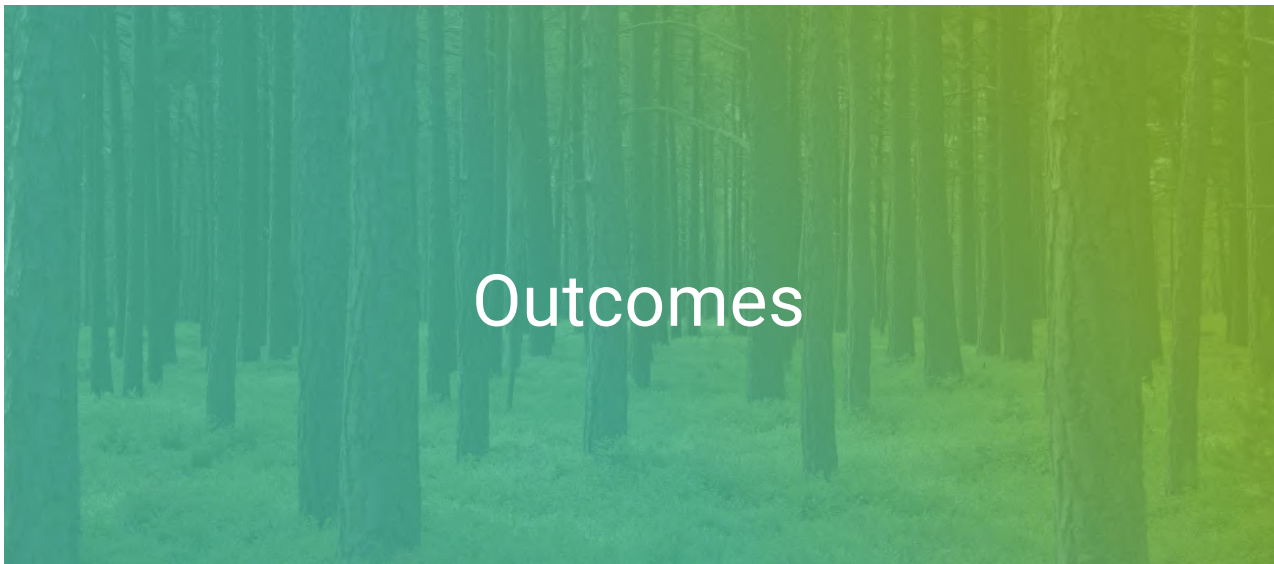


The expansion of air conditioning in India and the resulting challenges represent a growing system within the country's greater energy system. Air conditioning is an amalgam of interrelationships between technology, policy, and culture that will grow even more complex as India continues to prosper while pursuing sustainable development. Making sense of the system will lead to a more informed understanding of the relationships between stakeholders, the flows that bring them together, and the points of leverage available to affect change.

By providing educational information and policy support, cBalance has chosen to focus its FairConditioning efforts on key stakeholders to gain the greatest influence within the system. The program's primary mission is to reshape the way the country views air conditioning to interrupt the positive feedback loop created by a prospering economy, AC demand, and the resulting health and environmental impacts. Establishing cross-sector partnerships has proven critical to effectively engage with organizations that will support both current and future development within India. cBalance identified private businesses, universities, and professional societies as being in a unique position to change how future engineers, developers, and contractors view air conditioning in the country. The latter is in the driver seat for development in India and will determine what technology is deployed.

The system components are linked together by a variety of flows that include information (often in the form of education), energy, funding, technology, policy, and cultural behavior. As seen in the system map below, stakeholders may contribute or receive multiple flows, and the flows themselves may hold greater importance than others in the role that stakeholder plays. cBalance's choice of partnerships reflects where they consider their efforts to be most effective in changing behavior.





Outcomes

Strategy Interconnectedness



Outcome Breakdown

Governance/Regulations:

If we... improve governance and regulations to shape and create new policies to enforce the importance of energy efficient buildings and advanced building codes and designs

Then we... will be able to meet energy efficiency and clean energy standards that are needed in order to reduce carbon emissions

So that we... provide solid leadership and direction in order to meet conservation goals

Education:

If we... improve the core curricula of architecture and engineering programs at universities to educate students on pass cooling techniques and energy efficient designs

Then we... increase the number of architects and engineers who are equipped with the knowledge and strategies to build energy efficient buildings that do not require air conditioning

So that we... improve economic development and create more jobs in the workforce which will both reduce poverty and increase environmental gains

Finance:

If we... have multiple organizations and associations providing financial support and investment strategies

Then we... will expand the knowledge of expertise and create more channels of communication

So that we... create the space for cross sector collaboration and open the door to new partnerships

Influencing Behavior Change:

If we... encourage large corporations and associations to implement policies focused on workplace energy efficiency education such as proper thermostat settings and smart interior designs

Then we... increase the probability that corporate buildings will use less traditional air conditioning and employees will grow accustomed to higher indoor temperatures, changing the dress code appropriately

So that we... improve the system of energy efficiency and usage by incorporating education and decision making policy as major influencers at every stage of the market

Leadership Strategies and Innovation:

If we... encourage and promote the usage of storytelling to help change the narrative around the need for a luxury air conditioner and highlight the innovative technologies of FairConditioning

Then we... will reduce the number of air conditioners purchased and increase the importance of unique architectural designs and increase the amount of people that want to invest in FairConditioning

So that we... create a sense of community amongst FairConditioning users. In addition to increasing economic development and providing more job opportunities to lift people out of poverty

Author Reflections

Garrett Davidson: What strikes me most about Vivek is his willingness to challenge status quo while attempting to instill a better future for the people of his country and the world. He seems to have a natural understanding of human relationships, the importance of trust, and the ability to identify leverage in a system. He bridged cultures by merging aspects western, progressive culture with that of his own to support his causes and beliefs. This case study has shown me the importance of courage if you want to be a change maker. It requires an entrepreneurial mindset to find a problem and take the risk to fix it, along with selflessness and altruism to work for the betterment of society. It was interesting to hear the quote he offered us after our group members had the great idea of reaching out to him. “I latched onto things and pathways that made sense to me, that felt aligned with peace, non-violence, justice and beauty... and tried to-try to hang onto them as long as possible without questioning them too much.” It has a serendipitous feel to it, but his approach to FairConditioning showed me there was intentional direction, alignment, and commitment. I interpreted his message as advice to follow what you believe is right and trust your instincts along the way. I’d also be curious to learn more about the people in his support network, as it seems successful entrepreneurs are great at building strong teams around them.

This team meshes well together and I think everyone brings a lot of different skills to the table. There is a strong commitment to timelines and that has allowed for flexibility and trust within the group. I have been impressed with the groups creativity and desire to put forward a project they can be proud of. Previously, I felt there was a need for a designated leader for these projects, like a PM, but this experience has proved me wrong. We all felt the pressure of coming to the end of the program, and everyone was accommodating and flexible. This experience would have been different in India, but I feel we made the most of it. Thank you for a strong ending to the year.

Alyson Lee: I really enjoyed learning about the FairConditioning program and getting the opportunity to meet Vivek. Meeting and interviewing Vivek allowed me to learn more about the program from his point of view and better understand the challenges that he faced. It also was exciting to see what he has planned for the future and see how he wants this program to grow. Although this case study was large, it really helped put all the things we learned over the year into perspective including a stakeholder analysis and outcomes table. Vivek has such a positive view on life and made me once again realize how much I take for granted in the United States.

Working with my teammates was a great experience. We were able to use our strengths and weaknesses and create a super cool project. We were also able to challenge ourselves and push outside of our comfort zones. Although this was a big assignment, I think we did a great job supporting one another and dividing up the tasks. Also we were able to meet all internal deadlines and came to group meetings prepared to discuss.

Trisha Porter: Researching and writing about the FairConditioning program was definitely a highlight of the XMNR program for me. This program was a great example of how everything we have been studying this year can come together to create systemic change - from engaging stakeholders, to developing the right strategies, to understanding the interconnections and then pulling levers in the system, to creating underlying change that will affect the system as a whole. Vivek is an amazing changemaker that is able to see the system and find ways to make long-term changes that will have a tremendous impact. Growing up in the U.S., I take air conditioning for granted and I have never given much thought to the impact our AC usage was having on the environment. I’m left to wonder how America could handle this switch to sustainable cooling technologies and if anything like this is being done here. I look forward to incorporating the lessons I have learned while studying the FairConditioning program into my next job in the sustainability field.

As for team dynamics, I felt like we started with a strong 3SO from last interval and upon deciding which direction to take our report, it was just a matter of gathering additional information and piecing it together. I’m proud of this submission although I know we could have done a more thorough analysis if we had had more time. Our team discussions were productive and we leaned on our strengths to finish strong. At the same time, I feel like I was able to add to my skillset - as I want to get into data visualization, I was able to gain experience in Flourish for this report.

Josh Stanley: This case study that we completed on Fair Conditioning was a prime example of how to go about addressing a wicked sustainability problem. It incorporated so many of the strategies and concepts that we have been learning about in the previous months of the XMNR program. From systems-based thinking and 3SO sensemaking to boundary spanning leadership and collective impact, Fair Conditioning utilizes all the right tools to go about affecting change. Vivek is a model changemaker and an absolute inspiration. His role in this is proof that with the right values and a real sense of purpose and motivation, one can set out to make real, systemic change in the world. There is no doubt that I will refer back to Vivek and this project in my future professional life when I am unsure of how to approach a complex problem. I feel fortunate that I got the opportunity to study such an interesting and inspirational sustainability initiative.

We really hit our stride in terms of teamwork on this project over the last two intervals. All of the research we conducted and compiled during interval 10 to complete the 3SO set us up for success on the final narrative. I'm incredibly grateful that I had such awesome team members to collaborate on projects with over the last few months. I think our perspectives complemented each other quite nicely and led to a final product that I am very satisfied with. In the future I can only hope to work with others who are even half as intelligent and insightful as the members of this team. I will definitely miss getting to see all of their lovely faces each week!

Elise Trelegan: Learning about the Fair Conditioning program was undoubtedly one of the most impactful experiences for me during the XMNR program. There are many parallels in the types of system change that I am working on in my own job, including some similar stakeholders (university faculty, deans, and student practitioners). Reading about the program and then hearing Vivek describe how he operationalized the theory of change made me realize how I can strengthen my own work by more clearly articulating how the different lines of work compliment each other and ultimately lead to that next-level change among the different dimensions of our team. More than anything, Vivek is a motivator and has cracked the nut for communicating a complex systems-change effort in a way that inspires others. Every project can benefit from a "changemaker" and I'm eager to find ways to model his behavior and inspire others to step into that role as well.

In terms of team dynamics, our team got off to a fantastic start with a very strong 3SO during the first interval. I think this provided us with a very convenient body of work to build our final case study. Reflecting on the project, I am proud of what we have created, though I feel like we could have challenged each other to be a bit more innovative had we the opportunity to meet in person. Through both XMNR and regular work, my realization is that quality work can be made through an all virtual context. However we still haven't fully figured out how to recreate those situations where out of the box thinking leads to novel and convergent ideas.

Nicole Troy: The opportunity to learn about the Fair Conditioning program and explore the system and its operationalization was one of the most impactful projects of the entire program for me. I felt like being able to dive deeper into this project was a great way to apply the many concepts we had learned throughout the XMNR program and to add our own creative elements to the final product. Additionally, I was personally very inspired listening to Vivek Gilani describe his own motivation in sustainability and his passion for driving change and bridging stakeholders. His vision for collaboration and trust building provided more evidence that sustainability leadership is more than just technical and systematic understanding but about social elements and adaptation. Vivek's clear, empathetic and inspired visions gave me the opportunity to reflect on the type of the leader and "changemaker" I would like to be moving forward after the program.

I once again felt very confident in our team's ability to work cohesively and to create a focused and strong project. I believe that our greatest assets as a team have been our planning, discussion, and flexibility. Throughout the project our communication and ability to express visions was open and led to fruitful dialogue about what we were hoping to create as a final product. As individuals we are all very adaptable and willing to put in the time and effort to help one another when it is needed, which creates a safe space for trust and productivity. I have greatly appreciated working with you all. Especially in a virtual setting, it has been refreshing to still have such a great working relationship where we were able to build a strong team dynamic

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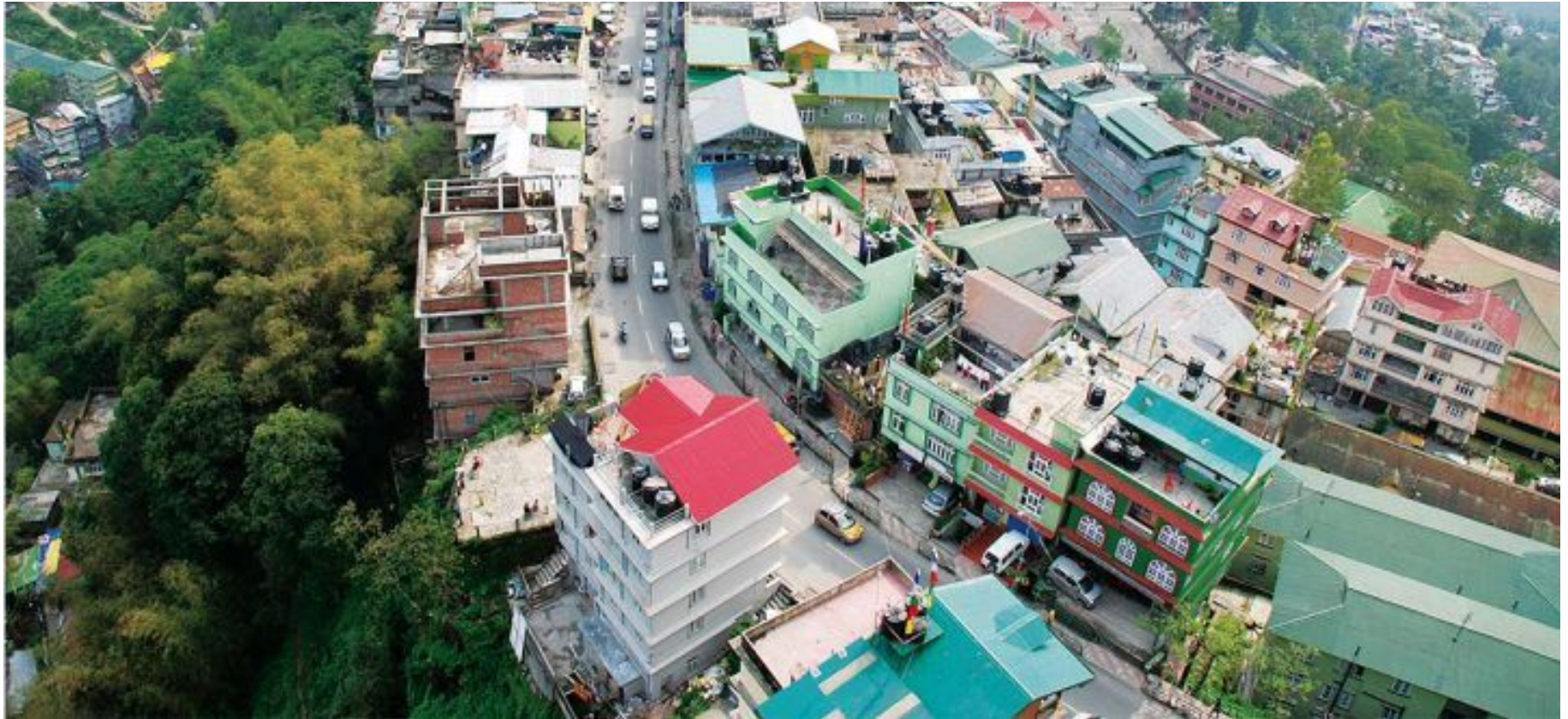
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The Case for Comfort

December 2020



XMNR | TEAM 2

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Balancing Climate, Communities, & Cooling

The technology we currently rely upon to keep cool is causing our planet to warm. As the global middle class continues to grow by the millions, the consumption of emission-intensive resources such as transportation and refrigeration are expected to increase as well. In India alone, it is anticipated that air conditioning units will skyrocket from 50 million today to over 300 million by 2035. If gone unchecked, the emissions from this growth alone will have climate changing quantities of greenhouse gases (GHG).¹ Through its Fair Conditioning project, cBalance hopes to redefine how we provide thermal comfort that keeps us and our planet cool.

cBalance is an innovative organization working to build the tools, strategies, and emissions reporting needed to mitigate climate change. Leading this charge is Vivek Gilani, the Managing Director of cBalance. The Fair Conditioning project was established within cBalance to tackle the increasing levels of GHG emissions related to traditional air conditioning technologies. In India, air conditioning is one of the first comfort purchases by those emerging into the middle class. Traditional cooling units are a status indicator but Fair Conditioning hopes to socialize more environmentally conscious technologies.

Fair Conditioning aspires to address this challenge by facilitating *ecosystem change* within the architectural institutions, as described by Gilani, by seamlessly embedding sustainability into the educational programs, design, and construction of all building structures in India. One facet of Fair Conditioning, the Academic Curricula Integration Project (ACIP), focuses on building partnerships with school boards, students, and industry professionals to grow a network of ecologically-minded ambassadors. If the sector can adapt to these greener disruptions, a substantial reduction in HVAC energy consumption is possible as cooling makes up approximately 60%² of summer energy use, and climate change promises ever warmer summers. These ambassadors can incorporate the ideas of, and build support for, green building principles so that universities and institutions will be graduating a generation of sustainably-minded architecture professionals. It is this bridging of the traditional ways with the more disruptive innovations that will allow for a profitable and sustainable transformation in architecture and cooling technologies.

Sustainability Challenge

The Indian subcontinent is home to the world's largest democracy. It is also home to a growing middle class with a desire for the comforts and symbols that go along with increasing wages and purchasing power. As India looks to grow its economy, and subsequently its middle class, it is imperative that the country develops integrated and mutually reinforcing sustainability strategies so that as its economy improves so does its

¹ Kumar, A., et al (2020). Low Carbon Cooling Solutions for India - WWF Report 2020. Retrieved 2020, from https://wwfin.awsassets.panda.org/downloads/wwf_india_report_on_low_carbon_cooling_solutions_for_buildings_in_india_final_web_ver.pdf

² Dzieza, J. (2017, September 14). The race against heat. Retrieved December 01, 2020, from <https://www.theverge.com/2017/9/14/16290934/india-air-conditioner-cooler-design-climate-change-cept-symphony>

progress towards social and environmental Sustainable Development Goals. With a per capita GDP that has almost doubled since 2010³, India faces a demand for energy that will far outstrip current levels. Its economic and energy growth strategy has a direct impact on environmental impacts such as GHG emissions. Realizing that India's building and infrastructure development strategy is only 30% complete,⁴ there is ample opportunity to develop future fit, green buildings that demonstrably reduce GHG emissions. After the purchase of their first automobile, says Gilani, the next thing the rising middle class of India purchases is an air conditioning unit. Indeed, the assurance of thermal comfort is rapidly becoming more than a luxury along the equatorial belt. The increased need for cooling and energy have an increased impact on the very climate that creates the need for cooling, creating a feedback loop that exacerbates the problem. The projected AC energy consumption will be 338 MT of CO₂ by 2030, which is 12% more than in 2010. This figure does not account for the additional GHG emission for the 1,010 coal powered plants needed to meet the increased energy demand⁵.

Current architectural and HVAC practices are another feedback input into the larger warming system. Modern Indian architecture tends to follow Western trends, inclusive of methods that would have beneficial environmental impacts in more temperate climates. In India, however, these methods often go awry, changing the efficient glass structures of a North American building into a heat trap in the tropical climate of the Deccan plateau. Gilani understands that the educational systems that produce India's builders and designers are the key to solving those issues. He and cBalance believe that academic institutions developing curricula specifically with home-grown Indian approaches to GHG reductions and the deployment of Indian innovations could be a major part of providing all of India with a sustainably cool future. As Gilani considers the downstream effects of curricula and other incremental systems change, Fair Conditioning's accomplishments will also be realized as progress toward several SDGs. On the surface, the reduction of GHG emissions from the implementation of sustainable cooling practices will be a significant aid in climate action (SDG 13). Furthermore, the incorporation of sustainable practices in India's business of architecture will lead to more people with access to cooler spaces, fostering well-being (SDG 3) and affordable and clean energy (SDG 7); and it is all starting in architecture workshops and classrooms.

Key Actors

Vivek Gilani is an Ashoka Fellow⁶ who has dedicated himself to the issues associated with GHG emissions and the effects of climate change on India. His dedication to environmental issues began at the age of 16 when he became involved in the Association of Youth for better India, which focused on waste management. At this young age, he was instrumental in mobilizing communities as he worked to begin separating waste in his own building and further helped form street committees to continue the work. Following a successful career in the United States as an environmental engineer, Gilani saw an opportunity to make an impact for the better in his home country through efforts to move India away from the western concept of air conditioning towards a more sustainable concept of thermal comfort. He has developed a variety of tools for measuring

³ The World Bank. (2020). GDP (current US\$) - India. Retrieved December 01, 2020, from <https://data.worldbank.org/indicator/NY.GDP.MKTP.CD?locations=IN>

⁴ Energy Conservation & Commercialization ECO-111, 2020, from <http://www.worldcat.org/identities/lccn-n2009214719>

⁵ World Bank (nd). CO₂ emissions (metric tons per capita) - India. Retrieved November 25, 2020, from <https://data.worldbank.org/indicator/EN.ATM.CO2E.PC?locations=IN>

⁶ Ashoka Fellow Vivek Gilani. (n.d.). Retrieved November 25, 2020, from <https://www.ashoka.org/en-us/fellow/vivek-gilani>

carbon emissions and continues to be involved in civic engagement initiatives to educate Indian voters. Vivek is also Managing Director of cBalance, which was created to help organizations build carbon monitoring, planning, and reduction into their Enterprise Resource Planning (ERP) strategies⁷. The organization's vision is to "facilitate balance in carbon, ecological cost, and local communities to enable balance in global climate." The Fair Conditioning project was founded in 2012 and includes three other programs that concentrate on capacity building, corporate technology adoption and corporate sustainability in order to influence the entire sustainable cooling "ecosystem" in India and, looking forward, in other tropical climates.

Strategies Used

The Fair Conditioning initiative hopes to use homegrown strategies, such as passive cooling and reflective paints, which can help eliminate the need for air conditioning, along with other sustainable and energy efficient methods of cooling, designing, and building tailored specifically for the Indian climate. Recent data indicates that there are just under 900 architectural schools in India⁸. If Gilani, cBalance, and Fair Conditioning are successful in assisting the development of new curricula and practice, students in participating schools will leave not only with a degree, but with a philosophy that takes climate into account from a design's inception, without the need to add in inefficient air conditioning after the fact. ACIP and Fair Conditioning offer an opportunity to be part of the forefront of environmentally conscious design. Embracing ACIP philosophy can also prove attractive to prospective students who demand a more environmentally and socially conscious approach to architecture. By presenting themselves as centers for purpose-driven learning, Fair Conditioning partners are focusing on India's future and addressing the challenges of climate change head-on by building the capacity and capabilities of the next generation of unconventionally cool architects, engineers, builders, professors, and HVAC technicians. As these groups leverage "fit for purpose" learning they become ambassadors of change to not only design and develop new strategies and technologies, but to equitably disseminate these concepts and ideas across India's University System and Centers of Excellence. They have not allowed themselves to be satisfied with just developing new strategies, but rather strive to deploy them across India through their students, professors, and trained professionals.

There are a number of important groups and individuals that play into the overall strategy of moving building practices and cooling to a more environmentally friendly strategy. Fair Conditioning is leveraging ACIP to influence the underlying assumptions of professionals entering the workforce; not just members of the architectural community, but also Heating, Ventilation, and Air Conditioning (HVAC) professionals as well. By laying a foundation of environmental responsibility in the basic educational principle in which these students are being trained, Fair Conditioning is hoping to change the entire system. ACIP is not a forceful presence in the room but a supporting partner in the development of new curricula. Through a thoughtful consideration of successes and failures, Fair Conditioning has developed a methodology of "hand-holding" or accompaniment with educational professionals. By providing assistance in the development of curricula, Fair Conditioning has avoided the trap of appearing to claim expertise over career educators and experts. It has instead allowed the experts to develop the curriculum using pedagogical methods that work best

⁷ cBalance - Carbon, Cost, Community, Climate. (n.d.). Retrieved November 25, 2020, from <https://cbalance.in/>

⁸ Architecture Colleges in India - Admissions 2020, Fees, Courses, Placements, Cut Off. (n.d.). Retrieved November 25, 2020, from <https://www.shiksha.com/architecture-planning/colleges/colleges-india>

in their specific institutions, but with an infusion of environmental responsibility. They have also learned, after some hard lessons, to circumvent internal conflicts that exist between different schools of thought within the larger architectural community by assuming the role of assistant instead of attempting to assume a more directive role.

System Response

The system is responding slowly to Fair Balance's efforts, and current events have impeded much of the progress that could have been made by this point. Gilani realizes the difficulty in tracking the impact of system change; it is slow work. Instead, the team has decided to focus on immediate metrics that also allow for reporting to potential founders in a timely manner. There has been definite progress, and signs of further progress are visible. Evidence of diffusion of the Fair Conditioning priorities have been seen in various student led discussions. Seminars are ongoing, including recent ACIP seminars conducted in November of 2020. As of 12/31/17, 24 train the trainer seminars had been held, resulting in 720 Architecture Professors at 120 colleges being trained in sustainable design pedagogy. 24 Engineering Certification workshops have been conducted, succeeding in 1,440 HVAC engineering students at 24 colleges receiving certification⁹. As more learning products are transitioned to an online format due to the COVID-19 pandemic, Fair Conditioning will also be able to measure engagement through views and downloads.

Beyond reporting the number of workshops and attendees, the Fair Conditioning team utilizes support calls to check in with their ambassadors. These calls provide quick feedback with regard to the effectiveness of training and changes that might need to be made to current education plans. Student testimonials act as another tool for measuring success; students need to be actively engaged to expect any achievements downstream. It is a great indicator of success for ACIP if a student continues the conversation. As more students and professionals graduate through Fair Conditioning seminars, a larger base of knowledge and practice will be built, building a legacy of expertise and practice for a better Indian future, reaching towards the 60% reduction in AC usage noted above. Future legacy operations seek to obtain formal adoption of ACIP practices as a fundamental part of the benefits of membership in various professional organizations. One of the biggest green-flag metrics for the program, according to Gilani, is a university wanting to scale up an idea. As the system in India begins to respond, Gilani has witnessed the potential scalability for the program in other tropical climates. Fair Conditioning has been approached by a college in Barbados with hopes to employ a similar program for capacity and knowledge building of their educators.

⁹Gupta, D. (2016, April 07). Fairconditioning: Evidence-Based Policy Making Energy-Efficiency Prog... Retrieved November 25, 2020, from <https://www.slideshare.net/dhruvg1/fairconditioning-evidencebased-policy-making-energyefficiency-program-60600194>

Lessons Learned

Eric Torraca

The biggest takeaway for me on this particular project was how difficult it can be to achieve direction and alignment, even with a group of high performers with good intentions. Speaking for myself, I struggled with focus and the level of effort needed to write about what I found to be a fascinating project involving fascinating people. Between the state of the world in general, and operating in what I feel is a general mental fog, cutting through and putting out a good product proved challenging. I think the thing that kept me going was the desire to not let down my teammates. All told, I think it's important to remember that direction is critical and if there's confusion in the team as to who is responsible for what and what the actual end goal is, the entire project becomes monumentally more difficult and hard to grasp. Outside circumstances have a direct impact on how the team perceives the task at hand, and when everyone is tired or stressed, getting that clear direction is difficult.

On a more direct level, I think Vivek is an excellent example of how leadership can influence a system without overwhelming authority. Vivek's passion for his projects and his ability to motivate others, is only overshadowed by his ability to see the actual obstacles in his way. I was impressed by his insights about working with and around the internal conflicts in the academic community within the architectural departments. His ability to bring multiple potentially conflicting groups to the table is impressive. That level of insight is in no small way the reason for his success.

Heather Pfahl

Across the globe, and in my work, it seems many sustainability practitioners, academic institutions and policy makers are talking about the language of systems change, but few seem to have mastered the practice or how to communicate the theory in a way that inspires coordinated action that can drive collective impact. This project was one of the first examples I have seen of a well communicated, well-defined theory of change and stakeholder engagement strategy that exemplified the secret sauce of what (in theory) makes systems change possible.

Below are my insights of what enabled success thus far and what will enable even greater success going forward, especially if funding can be leveraged and disseminated for the other outcomes that Fair Conditioning intends to contribute toward.

- **People:** Fair Conditioning had the right people in place. First, Vivek Gilani embodies the qualities of a systems leader, which is critical to any collective impact strategy. Vivek is people oriented, patient, purposeful, pragmatic and able to deliver a business pitch on a very complicated challenge in a way that inspires action and investment. Additionally, it seemed that the people Vivek and his leadership team hired had strong and solid knowledge of systems change practice and were able to reflect on the relationships within the systems. The team managed complex power dynamics, egos, assumptions, tensions and perspectives of a diverse group of people and professions. Simultaneously, the team seemingly built a coalition of change agents to amplify the aligned purpose and pedagogy so as to inspire positive response from students and faculty.
- **Purpose:** Collective impact requires alignment on vision, direction and coordinated commitments. Fair Conditioning was able to effectively communicate the value of their program to decision makers, change agents and investors/ donors to turn purpose into action.

- **Process:** From the outset the Fair Conditioning Program developed a human centered approach to design. This approach enabled well facilitated dialogue between diverse stakeholders. Additionally, there seemed to be solid project management, inclusive leadership and clarity on roles and responsibilities. Part of the process that was innovative is the team's ability to adapt to changing plans, funding, actions, processes and new partnerships.
- **Communication:** The challenge with systems leadership and thinking is that the communication of the theory into value addition action often gets lost in translation. Vivek, not only is an amazing leader with great foresight, stakeholder engagement and management skills he is a one of a kind communication expert. Vivek has an uncanny ability to speak to the hearts, mind and hands (actions) of a broad array of actors.

These key success factors, what I call the secret sauce for 'Systems Leadership' have illuminated actions, management skills and communication methods that I hope to integrate into my current role at Mars and in my future roles. As global actors look to address 'wicked' challenges we need new ways of working, thinking and partnering. Systems Leadership provides the FUNDAMENTAL FOUNDATION for collective impact.

Patty Fisher

I was inspired listening to Vivek Gilani describe his journey and how he evolved his ideals to drive change. I related to his self confessed, "naive thinking" on sustainability and green consumption. Vivek demonstrates many of the leadership for sustainability traits we have discussed in our XMNR course. From reflecting on his own purpose to using many of the influencing strategies needed to drive system outcomes. He leveraged social innovation, an adaptive mindset, and collaborative thinking to build trust with the academic community and to develop programs that address both downstream and upstream impacts. It motivated me to think about my story, my journey and the universal leadership skills needed to make a difference in sustainability.

Our team kicked-off the project with a quick AAR to review the process and learnings from our last project. Although we did not assign a project manager, the team quickly mobilized around key milestones to manage the assignment. Due to our global conditions, we struggled to align on an angle for building our case. We had a number of team meetings to discuss the Fair Conditioning challenges but could not pinpoint exactly how to structure our story. It wasn't until after listening to Vivek that we aligned on the ACIP. I am thankful my team is flexible, smart, and open-minded. I learn a lot from our discussions and the team keeps each other motivated to finish the XMNR strong.

Joel Osborne

During the course of the latter half of the XMNR program and we were all given known teams, it was a tough situation for all involved. Not only were we given the prospect of interacting and working with individuals, which on its own has challenges, we were given this challenge in the midst of a global pandemic. Additionally, with the impacts of COVID-19 affecting us all on many levels, we had to learn to work with one another in a completely virtual environment. For someone like myself I found it difficult to truly say what I was thinking, ask questions when I felt lost, or any other amount of issues. However, after getting to know the wonderful people in my group these challenges were lessened and I feel like with this

assignment in our final month we began to hit our stride. We began learning what each other were good at and utilizing these skills to produce an excellent assignment that has yet again opened my eyes to another massive issue worth tackling.

As my other teammates have mentioned, air conditioning isn't exciting on the surface level. However, there is much to be said about the immense pride and vigor displayed by members of the FairConditioning project that changed my view on the subject. That's what will make this program a success, Vivek and others involved have shown such energy behind this project that someone oceans away cares deeply about the subject. Something I find to be truly incredible.

Sara Payne

When it came to earlier projects with this team, we didn't see the need to assign a project manager. This assignment demonstrated the importance of setting a precedent for project management. Our process on this project could have been much smoother had we already established and settled on workflows. With the year we have had and being so close to the end, I think our commitment to fairness and getting the work done demonstrated our dedication to each other, but we could have taken the commitment further.

Air conditioning is not the most exciting project, but Fair Conditioning is working to solve an important issue. When it comes to sustainability, we might not be handed the sexiest project, but working to find the hook or what will excite other people is as high on the list as understanding the science and the details. Vivek is an amazing leader for the Fair Conditioning program because of his engineering expertise, but what propels him forward is his passion and skill as a storyteller. With an undergraduate degree in journalism, I felt like I was at a disadvantage to do well in this field, but being able to identify the lead is just as important in sustainability.

Tori Yauch

This project taught me that sustainability isn't a mountain to be overcome so much as a mountain to be chipped away at. It takes many innovative people working across all industries and sectors to bring about meaningful change to build a globally sustainable future. I always have said that I have no desire to change the world, but to improve my own little corner of the world, and seeing Vivek affect change in his corner gives me hope that a lot of good can be done in each of our corners. It doesn't negate the value of collaboration or working across different boundaries to multiply impact, but ensures that progress can be made without trying to conquer the whole mountain. My background being in social sciences, I have found it really great to see how prevalent being able to understand the social systems which people operate as a means to solve sustainability challenges. Vivek is doing a great job of considering the importance of traditions and norms when addressing thermal comfort.

Appendix

3SO | The Case for Comfort:

Stakeholder	Goals	Strategies	Influence	Interest	Impact
Nonprofit					
cBalance	<ul style="list-style-type: none"> - Mitigate energy use and impacts of refrigeration technology by finding balance between the Carbon Cycle, Ecological Cost, and Local Communities. - Cultivate a better understanding for businesses of measuring Carbon Footprint and have them follow a sustainability strategy roadmap in order to achieve measurable mitigation. 	<ul style="list-style-type: none"> - Developing tools, strategies, and GHG emission reporting - Does Carbon accounting for major organizations such as the India Cricket League and the city of Shanghai. - Facilitates system change in traditional cooling to be more sustainable through its Fair Conditioning program. - Utilizing better methods of measuring and quantifying impact as a means to generate more meaningful mitigation strategies to reduce carbon footprints. - Developed the first India-specific emissions factor database. - Developed The Green Signal - India's first sustainability eco labeling program. 	Medium	High	Direct
Fair Conditioning	<ul style="list-style-type: none"> - Facilitating system change from traditional cooling to sustainable options, reducing GHG emissions. 	<ul style="list-style-type: none"> - Project within cBalance in collaboration with Noe21 and funded by Shakti Sustainable Energy Foundation and previously also by USAID. - Encourages students to engage in grassroots efforts to bring thermal comfort into traditional architecture curricula. - Reaching academics, professionals, and corporations to drive behavioral change as an ambassador for change in cooling technology and policy advocacy. - Four sub-programs which focus on education, professional ecosystem building, corporate technology adoption, and corporate behavior change. - Projects in 8 cities, held 96 workshops, reached 10K+ stakeholders. 	High	High	Direct
Vivek Gilani	<ul style="list-style-type: none"> - Shift design principles within architecture programs that promote thermal comfort without or with limited use of refrigeration technologies. 	<ul style="list-style-type: none"> - Communicates thermal comfort alternatives to traditional refrigeration technologies as better suited to the climate and lifestyle in India; A/C is overused or not necessary. - Engages with school boards to initiate a shift towards alternative architecture education that transitions away from traditional refrigeration. 	High	High	Upstream

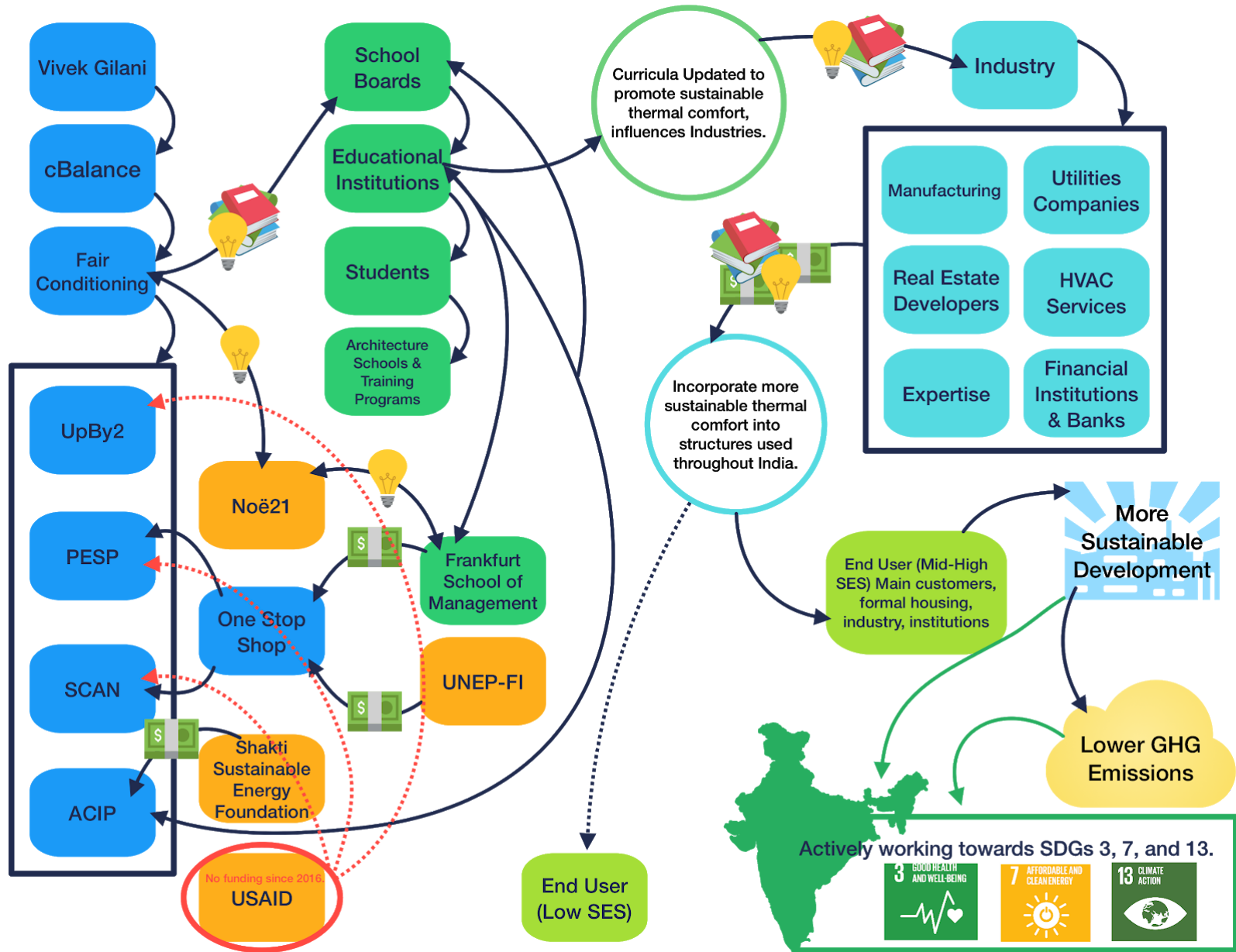
Stakeholder	Goals	Strategies	Influence	Interest	Impact
Funding					
Shakti Sustainable Energy Foundation	<ul style="list-style-type: none"> - To see Fair Conditioning efforts take off and influence change across architecture educational institutions and building codes. - For India to enter a cleaner energy future. 	<ul style="list-style-type: none"> - Funding ACIP makes them a stakeholder of high interest and influence. - Works to facilitate India's transition to cleaner energy by aiding the design and implementation of policies that promote clean power, energy efficiency, sustainable transport, climate policy, and clean energy finance. 	High	High	Upstream
USAID	<ul style="list-style-type: none"> - US Policy and Trade Interest; Interested in generating public goods which benefit India and the USA. *2016 Administration halted this funding. *COVID19 poses risk for budget cuts even if the new administration restarts funding. 	<ul style="list-style-type: none"> - The USAID Partnership to Advance Clean Energy - Deployment (PACE-D) Technical Assistance Program works in India to promote low-carbon growth through clean energy, develop insights on scaling pilots, develop innovative financing mechanisms, and build capacity of stakeholders who are instrumental in achieving low-carbon growth. - Accelerate public goods through deployment and use of clean energy produced, expand US-India trade and investment linkages, and facilitate exchange of information/best practices. - Works with policymakers, regulators, companies, investors, clean energy associations and others to increase uptake of more efficient and cleaner energy. 	High	Medium	Enabled
UNEP	<ul style="list-style-type: none"> - Establish the design of a collective impact program that highlights the role for select partners which could lead to other activities implementing and managing the cBalance facility in the near future. 	<ul style="list-style-type: none"> - UNEP-CCAC & Frankfurt School involvement builds credibility. - Works with Frankfurt School of Finance and Management regarding funding and finding ways to bring about increased adoption of non-fluorinated refrigerant cooling technologies through a technical assistance facility. - Current funding points to lower influence, could increase. 	Low	High	Enabled
Noe21	<ul style="list-style-type: none"> - Catapult India directly into an energy efficient economy. - Increase climate resilience throughout India via partnership with Fair Conditioning. - Provide spaces for MBAs to design innovative funding scenarios for reducing GHG emissions in the architecture, cooling, and construction sectors. - To identify, evaluate, and promote powerful as well as realistic solutions to reduce greenhouse gas (GHG) emissions, using a catalytic approach. 	<ul style="list-style-type: none"> - Geneva-based NGO focused on catalyzing reduction of GHG through various collaborations. - Collaboration with Oak Foundation and the State of Geneva to fund pilot programs where natural refrigerants are utilized through voluntary adoption. - Strategically partners with knowledge that India's rapid development must be sustainable as millions will be seeking similar luxuries such as AC that developed nations enjoy. - Promote localized solutions that have a bottom-up approach that they then work to integrate with top-down policy approaches. - Pilot in 2013 completed with the objective of phasing out air conditioners that use synthetic refrigerants, phasing in energy efficient alternatives. 	Low	High	Enabled

Stakeholder	Goals	Strategies	Influence	Interest	Impact
Education					
Students	<ul style="list-style-type: none"> - Instigate changes in architecture curricula across multiple universities, and impact potentially hundreds of campuses across India. 	<ul style="list-style-type: none"> - Launching grassroots efforts on campuses for school boards to take up these issues of integrating more sustainable thermal comfort technologies into architecture curricula. 	Low	High	Downstream
School Board(s)	<ul style="list-style-type: none"> - To recruit from a larger talent pool. - Meet the needs of current students to increase retention rates. - Have Architecture programs that are providing relevant skills in the present market. 	<ul style="list-style-type: none"> - Recruiting talented students that wish to go on to work in this sector. - Identifying and implementing curricula that are the most relevant available. - Bringing in new ideas while also giving respect to those who have long careers in the industry. 	High	Medium	Enabled
Frankfurt School of Finance & Management	<ul style="list-style-type: none"> - Prove their usefulness as a tool of this nature for future projects such as this one. They also get great experience for their students. - Help programs working in sustainable cooling to mitigate potential financial barriers in instances where funding has stalled or dried up. 	<ul style="list-style-type: none"> - Designed current substitute for PESP and SCAN sub-projects: "One-Stop-Shop." - Driving a sound financial mechanism for this program in the absence of US funding. - Working with Noe21 through a bottom-up approach to enable partners to deploy energy-efficiency strategies regarding refrigeration GHG reduction to expand to 8 urban areas. - Utilize information from pilots to create international knowledge transfer and technology exchange related to alternatives to traditional air conditioning technologies. 	Medium	Medium	Upstream
Rachna Sansad Institute of Environmental Architecture	<ul style="list-style-type: none"> - Successful collaboration in this program would be beneficial for all students involved in the process and may lead to other opportunities for collaboration in other programs. - Shift educational institutions to make this methodology of architecture the status quo for future projects. - Create a new system of thinking in the sustainable cooling field to create a pipeline for next generation leaders to expand this field. - Form a unified vision among young professionals to train the next generation. 	<ul style="list-style-type: none"> - Promote Train the Trainer programs for architects and professors stimulate interest in environmental cooling technologies in this field for young students. 	Low	Medium	Direct

Stakeholder	Goals	Strategies	Influence	Interest	Impact
Industry					
Utilities Company	- Continue to be profitable and respond to customer demand regardless of what type of emissions energy produces.	<ul style="list-style-type: none"> - Ensure that adequate infrastructure and customer base exists while working to ensure demand increases. - Stay up to date on most profitable forms of energy generation. - Prevent blackouts that can reduce energy expense of customers. - Works with the government to shore up internal energy generation to become less dependent on energy imports. 	Low	Low	Enabled
Real Estate Developers	<ul style="list-style-type: none"> - Incorporating AC into buildings as a feature. - Adoption of Fair Conditioning style units in ways which reduce costs. 	- Developers can influence the ability for higher-cost strategies to enter the mainstream real estate market.	High	High	Enabled
Financial Institutions & Banks	- Continued profitable investment (units sold, buildings built). Their level of agreement will depend on the cost/risk imparted by the switch to this type of cooling. Influence on large scale projects can be significant.	- Banking will continue to finance profitable endeavors, and will need to see promising returns on pilots of alternative construction.	High	High	Enabled
HVAC Services	<ul style="list-style-type: none"> - Continued employment/profit and status attainment for being part of innovative changes in industry. - They would like to see additional adoption of AC installs. 	<ul style="list-style-type: none"> - Directly engaged by Fair Conditioning as a main mover in partnership with Architectural development. - They control the installation process. - Communicate with the architectural community to see how HVAC Services may be integrated into newer curricula. 	High	Medium	Direct
Manufacturing	- Decrease cost, increase revenues. Fair conditioning established relationships with many local, global Environmental and industry groups.	- Activating industry and industry association to influence consumer behavior, change corporate policies (dress code), or innovate new products.	High	High	Direct
Expertise	<ul style="list-style-type: none"> - Education and industry standards will be changed to meet fair conditioning standards. - Higher pay, more expertise, more satisfied customers/clients. 	<ul style="list-style-type: none"> - Work with Industry and Nonprofit stakeholders to provide knowledge needed to integrate more efficient thermal comfort technologies. - Avoiding the loss of jobs or status due to not staying informed of up and coming technology in the cooling sector. - Work with universities to recruit talent that can train members on new standards. - Collaborate with other technology ambassadors in order to create "ecosystem" change across the industry. 	High	Low	Direct

Stakeholder	Goals	Strategies	Influence	Interest	Impact
Individual					
End-User [Poor]	<p>Higher efficiency cooling will have health benefits and long-term financial benefits. AC comes with status, and may be viewed as an indication of success, potentially raising their stature in their community.</p> <p>Desired outcomes: Inexpensive cooling. Higher social status. Increased resiliency WRT increasing temperatures.</p> <p>Reliable power grid</p>	<p>This is a high interest group, but if more fundamental needs are not met this may not be high on their priority list and may seem a luxury out of reach.</p> <p>Degree of power and influence: Voice in numbers, very low buying power in some instances., but could be a large customer base. Subscription models could result in long-term customers. Emerging middle class may have a higher influence level commensurate with their rising status and economic influence.</p>	Low	Medium	Downstream
End-User [Wealthy]	<p>Increased access to high efficiency cooling. Lower utility bills. Potentially higher cost of individual installation.</p> <p>Cheaper AC, Increased or Sustained social status.</p> <p>They are likely to contain members that belong to other influencer groups such as consumer ambassadors or industry ambassadors.</p> <p>Shared interest in a reliable power grid. Shared interest in lower emissions as less power is required over time.</p>	<p>Purchasing power. Unknown and variable - Depends on memberships with various industry/government/academic groups</p> <p>Loyalties: Family, caste, class (unknown as to how these social distinctions might affect the adoption of the technology. Care should be taken as to how the technology is branded so that it does not convey a "lower class" label)</p> <p>Loss of face (being seen as having made a foolish decision), loss of wealth, status. Perhaps loss of status if AC becomes too common</p>	Medium	Low	Downstream

System Map:



System Map Description:

The systems map above highlights the potential pain points, numerous relationships, and probable opportunities that the Fair Conditioning Strategy influence or are influenced by. Each node in the system presents an opportunity or a limitation to time-bound project designs, uncertain funding strategies, theories of change, and management approaches. As we look at the system map we can reflect on our 3SO and identify pathways to overcome specific problems and address assumptions of specific partnerships and/or management approaches. Additionally, by looking at the map it provides an overview of how the Fair Conditioning program may evolve as funding opportunities catalyse iteration in the design, implementation, learning and scaling of strategies.

Strategies:

With key learnings from the ACIP strategies to-date, we believe the Fair Conditioning team has the opportunity to further impact the educational institutions, school boards, and students. Each is interested in playing a role to build India's future. With over 800 architecture colleges in India¹⁰, educational institutions would like to maintain a strong reputation, increase academic influence, attract students to their programs, and graduate India's future builders. The school boards within these colleges would like to ensure the curriculum prepares students with the knowledge of best available practices that implement high level skill sets and modern approaches to solve modern problems. Students are already eager to take part of India's future and look forward to a successful professional career. By leveraging diffusion theory, these key stakeholders are critical to spread the Fair Conditioning principles and make long-term adoption more likely. To scale the program, expanding from the current eight early innovator universities to the next segment of early adopter universities will be important. From there, the team will have a solid case to expand across a broader set of India's university ecosystem. Effective strategies for diffusion theory includes targeting the who and how communication is administered¹¹. The source of communication makes a big difference on whether people receive the message. In this case, leveraging students, faculty, and university officials to deliver the message, as "Ambassadors" can influence the receiver more effectively than if it comes directly from the Fair Conditioning team. It is also important to address different philosophies of architecture in the communications strategy to reach the varying art, science, and business interests. In the early stages of diffusion theory, early adopters tend to rely on different information sources, therefore, it is important to rely on research, use of experts, engage opinion leaders, and social networks. Not only will these higher education stakeholders help convince other universities to get on board with these new building principles, but they can also be instrumental in influencing consumers, businesses, policy makers, professional organizations, and the broader market. Influencers can inspire and spread the ideas in many ways, like hosting webinars, events, and network opportunities with peer and community groups. "The goal of the vehicle is to expedite the recruitment of

¹⁰ Architecture Colleges in India - Admissions 2020, Fees, Courses, Placements, Cut Off. (n.d.). Retrieved November 25, 2020, from <https://www.shiksha.com/architecture-planning/colleges/colleges-india>

¹¹ Stern, M. (2018). Oxford University Press. Social Science Theory for Environmental Sustainability.

low-hanging fruit enterprises that have demonstrable sustainability implementation and communication activity integrated into their business processes but haven't magnified their sustainability successes to encompass efficient and sustainable cooling for their building stock"¹².

Additional strategies to consider interpretive frame theory to direct the focus of 'conditioning' as an issue of economic inequality, public health, and perhaps using social identity theory to engage national or local pride for India. The benefits of deploying frame theory is connecting the fair conditioning to a broader set of educational stakeholders. For social identity theory, educational institutions, school boards, and students share common values and a common interest to build a strong India. Especially given the numerous global impacts, these stakeholders may have feelings of risk and threat. Through listening, learning, and researching, the Fair Conditioning team has an opportunity to further understand how each stakeholder defines the current situation and their role within it. Then, aligning communications with these pre-existing beliefs, identities and norms to unify the group. Also, through this discovery they may be able to co-create and introduce levers that are more specific to India's infrastructure. A new, co-created story can make stronger, emotional connections with these key stakeholders. Knowing your audience can make a huge difference in the effectiveness of different message framing¹³ and involving them in the creation of the story can make it stronger still.

Long-term, the system change will become a new habit or norm and what Vivek refers to as 'invisible', whereby sustainable cooling is fully integrated and not additive into the curricula. Through ACIP, Fair Conditioning will create trust across the system and make it possible for India to achieve balance in climate, community, and cooling.

Strategy	Outcomes	Success Indicators	Primary Stakeholders
Tech Ambassador	<ul style="list-style-type: none"> - Grow adoption beyond 8 universities currently in the program - Clear shift in building process from an added value post design to a non-negotiable values integrated in the initial concerting stages - Students/professionals are proud to be part of the movement and recognized professionally - Develop student/professionals advocates for life - Working to shift pedagogy that will - Corporate roadshows leading to Feasibility studies that explore sustainable air-conditioning alternatives 	<ul style="list-style-type: none"> - Recommendations resulting from studies are implemented into researched buildings - Large, prestigious corporations influence others by their incorporation of sustainable cooling techniques and technologies 	<ul style="list-style-type: none"> cBalance Vivek FairConditioning Students School Boards
Voluntary Adoption	<ul style="list-style-type: none"> - Grow university testimonials used to onboard new students and universities - Returning Indian Architecture to India leveraging past 'passive' cooling techniques: Indian architecture designed for the needs of India (Pride, heritage) - Expansion of inside and outside classroom engagement of students/professionals to drive sense of community and shared learning 	<ul style="list-style-type: none"> - Educational entities adopt FairConditioning into their curriculum. - New buildings in India incorporate sustainable cooling techniques in the future due to the beginning-of-pipe strategy 	<ul style="list-style-type: none"> Rachna Sansad Institute of Environmental Architecture (Educational organizations as a whole)

¹² De Rougemont, P. (2015). Noe21. FairConditioning 2014-2017, Cooling India Effectively and Sustainably. Retrieved November 20, 2020 from https://d52403b6-2253-4d67-b1bb-391f1f50a68d.filesusr.com/ugd/32162b_b94d9b0c030543138c50af9e4b937d09.pdf

¹³ Stern, M. (2018). Oxford University Press. Social Science Theory for Environmental Sustainability.

<p>FINANCE</p>	<ul style="list-style-type: none"> - Finance and economic value - Create self-sustaining revenue streams to reduce reliance on foreign investment 	<ul style="list-style-type: none"> -Shift of financial backing towards more sustainable sources - Self-sufficiency 	<p>cBalance Fairconditioning Frankfurt School of Management Financial Institutions Shakti Sustainable Energy Foundation USAID UNEP</p>
<p>Consumer & Industry Ambassador</p>	<ul style="list-style-type: none"> - Reduce GHG emission from a burgeoning cooling/HVAC system market in the 2nd most populated country in the world - Through system thinking approach, build trust with across university stakeholders - Build a pipeline of motivated leaders to contribute long term to the mission - Provide affordable, reliable conditioning options across all segments of the community that are environmentally sounds and sustainable - Solutions recognized as 'localized' or meet the needs of the community -Inspire a new generation of students - Contribute to industry standards and best practices - Contribute experts to local, regional, national and international org engaged in driving conditioning changes - Promote open-source, decentralized way of thinking for continued collaboration within and across stakeholder groups 	<p>A lessened carbon impact and emissions resulting from using the current standard of AC implementation</p>	<p>Noe21 Students Professionals University Boards Utilities Company Real Estate Developers HVAC Services Manufacturing</p>

Outcomes:

As the world's second most populous country creates a growing middle class, the luxury of AC will become rapidly accessible to more families and businesses. Fair Conditioning plans to tackle the growing issue of reducing GHG emissions from India's burgeoning HVAC market. Through our analysis, we found that tackling this wicked problem involves systems outcomes most closely related to SDGs 3, 7, and 13. Successful reduction in GHG emissions will push India forward in its climate action goals, which also pull the levers needed for good health, well-being, and more affordable clean energy. Fair Conditioning's current focus on its ACIP program hopes to accomplish these larger outcomes by eliciting an ecosystem change through the introduction of purpose driven curricula. More specific outcomes for this program include the adoption of strategies in undergraduate curricula at eight prominent universities in India and the integration of sustainable cooling pedagogy in professional development credits. These goals are easily monitored through tallying the number of programs that agree to incorporate the proposed learning strategies or how many workshops have been held. Assessments can also be used to determine the effectiveness of training such as follow up calls and testimonials to gauge receptivity and satisfaction. As we zoom out again, it becomes more difficult to measure outcomes in the quest for ecosystem change. Some chances to assess the effects of the curricula would be to measure installation of sustainable cooling technology and the implementation of sustainable building practices. Presently, there is no formal tracking of these measures. Fair Conditioning does not suffer from a lack of transparency at this point and may be a few years out from seeing measurable progress as creating a culture shift from curricula change is not by any means quick work.

ELLIE, DOMINICK, AND THE VERY HOT, SUPER ENLIGHTENING, AND EXTREMELY FUN INDIA TRIP!



DECEMBER 10

Team 3

Authored by: Luz Drada, Beth Feliciano,
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*f*AIR CONDITIONING

Prequel

“Ellie, Dominick, and the Very Hot, Super Enlightening, and Extremely Fun India Trip!” is a wonderful children’s story occurring in Pune, India. Two young American children, Ellie and Dominick visit their friend Sumesh. During their stay, the children are exposed to heat like they’ve never experienced before and what commences is an intriguing journey of self-discovery and learning.

While the book touches on several sustainable development goals, its storyline is predicated on an Indian program called Fairconditioning. This program focuses on Building-Cooling Demand-Side-Management (DSM) related education, capacity building, and pilot implementation programme. Fairconditioning aims to deeply integrate sustainability and efficiency into architectural and HVAC-engineering higher education curricula, into practicing architecture & HVAC consulting firms, and into commercial enterprises. The authors manage to impress upon the reader the importance and potential impact of this program in tropical regions of the world such as India, as consumer demand is expected to drive an increase in comfort cooling by an additional 225 million units by 2035.



In the story, the children recognize the inequities by comparing what they have at home in the United States, where nearly 90% of the population has Air Conditioning (AC), to their friend in India where only 5% of the homes have access to this climate change adaptation tool. While the children focus on their own comfort, what remains unknown to them is that nearly 12,000 people die around the world annually due to heatwaves. Even more concerning is the World Health Organization estimates that, without access to cooling, this number is expected to grow to more than 250,000 annually by 2050 (Radhika). These facts are

brought into the story by reflecting on how the heat is impacting Nani, the grandmother.

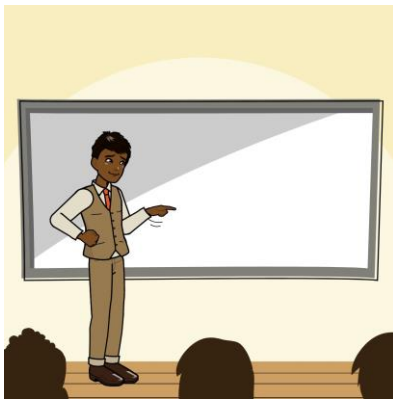
Ellie and Dominick are surprised to learn that, even though Sumesh’s family has an air conditioner, Sumesh’s dad can’t afford to turn it on because its energy efficiency is so poor. The children want to understand why the electricity shuts off and the only form of cooling, ceiling fans, stop working. Sumesh is particularly concerned about his grandmother who lives with him and seems to be struggling in the heat. Cultural differences become clear as Ellie and Dominick, observing the inequity, believe something can and should be done. Sumesh and his family believe what happens to them is not their own doing and therefore they accept inequality as a normal part of society (Hofstede).

As the energy brownout continues, the American visitors and Sumesh's family walk outside and are exposed to increased heat from the neighbor's air conditioning units and exhaust fumes from the generators that provide their systems with needed electricity, exacerbating the health concerns of the family. The authors also explain that urban areas, in particular, are affected by the increased heat as the buildings and roads absorb solar radiation creating a heat sink or heat island.



The reader is introduced to the concept of inequity created by those with the means to operate comfort cooling and generators.

The increased electricity demand of these cooling systems changes the energy consumption patterns of urban buildings and causes the brownout. Those with higher socioeconomic status can then run generators to keep their cooling systems operational, pollute the air with the emissions from the generators, and vent heated air from the exhaust of both the generators and air cooling systems. Those with limited means lose their ability to use even the simplest of cooling systems (fans and open windows) and are further impacted by others, explaining in-part, the "fair" in Fairconditioning.



Sumesh's father, focusing on the harmony and wellbeing of the family group, decides to educate the children and evaluate his options and contacts a close friend, Vivek Gilani. Vivek is the founder of cBalance Solutions an organization that co-created the Fairconditioning program. In the story, Vivek is hosting a Fairconditioning seminar where the children and Sumesh's father attend. There the children are inspired to think more efficiently about energy at their own homes in the United States and think globally about why Fairconditioning is important to everyone.

At the seminar, the children are introduced to Vivek, an environmental engineer and Ashoka Fellow, who also happens to be the founder of cBalance, a key stakeholder of Fairconditioning. Vivek explains in a manner that the children can understand that Fairconditioning arose from the recognition of the need for innovative and efficient AC and green consumption in India. Acknowledging the need of a collective systemic approach, cBalance's mission is to create tools for institutions and consumers, with the focus on development of Greenhouse Gases (GHG) and ecological footprint mitigation roadmaps in the pursuit of limiting global temperature, thereby promoting sustainable development.

What is difficult for the children to comprehend is the importance of the four unique Fairconditioning strategies used to engage highly influential stakeholders in the energy efficiency program

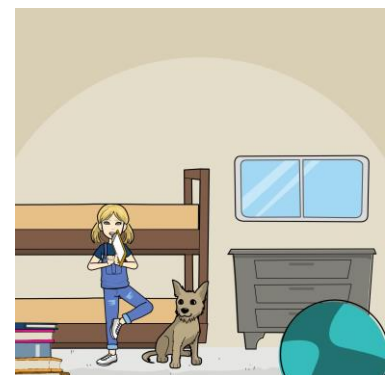


(Fairconditioning). One of those strategies is Academic Curricula Integration Project (ACIP), a program that focuses on how to address the systems that integrate a paradigm change not just for the energy and climate standpoint but also for the social equity and justice aspects. The goal of ACIP is to go beyond the idea of the environment and transform the architecture in India. cBalance along with the engagement of universities where Fairconditioning is an integral part of the curriculum, is changing the architecture schools' curricula and raising awareness among stakeholders.

Students' curricula in architecture & engineering education will be enhanced, so they graduate with the needed knowledge to achieve indoor thermal comfort in the most efficient manner, and integrate sustainability skills into architecture, Heating, Ventilation, and Air Conditioning (HVAC) consulting, and commercial firms. In the story, Dominick is inspired to become an architect to create energy efficient homes and buildings because of all that he learned at the seminar.

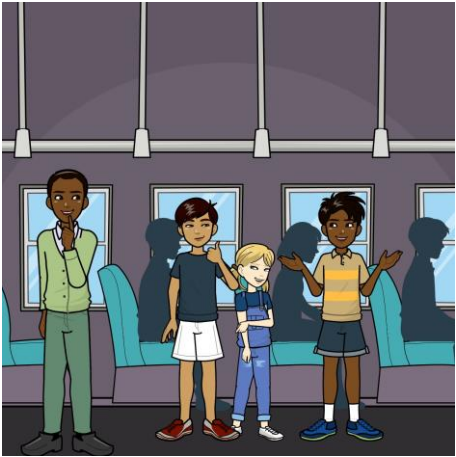
The technologic program empowers and enrolls technical experts and institutions with a high degree of expertise in the areas of energy efficiency, HVAC refrigeration technology, and environmental impact of space cooling. They aim to catalyze interest and enhance confidence among the technical decision-makers in commercial and industrial enterprises

Note: The Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE) has more than 10,000 HVAC&R professionals and 3,000 students as members across India. ISHRAE's primary objective is the advancement of the art and sciences of Heating, Ventilation, Air Conditioning, Refrigeration Engineering & other related Building Services (Radhika)



One of the key stakeholders that is inconspicuously omitted from the book is both the federal and state levels of government and the actions they are taking to mitigate people's need for cooling. More specifically, it is clear from India's Voluntary National Review Report on SDG implementation that it realizes the exponential rise in demand for cooling is inevitable, especially as such a rise is intrinsically tied to human health and productivity, and understands the importance of meeting this need effectively and in a sustainable manner. As such, India is one of the first countries in the world to develop a comprehensive cooling action plan launched by the Ministry of Environment, Forest and Climate Change (MoEF&CC) which provides a 20-year roadmap addressing India's future thermal comfort and the cooling needs of its people in a sustainable manner. The children learn the global

impacts of climate change and realize how India's efficiency in cooling can help mitigate climate change.



The thrust of the India Cooling Action Plan (ICAP) is to look for synergies in actions for securing both environmental and socio-economic benefits. The development of ICAP has been a multi-stakeholder inclusive process encompassing different government Ministries/ Departments/Organizations, industry, and industry associations, think tanks, academia and Research and Development (R&D) institutions. ICAP has recommended thermal comfort strategies for affordable housing projects under the Pradhan Mantri Awas Yojana. This is important for the affordable housing sector and low-income housing where the current focus is only on speed and ease of construction,

disregarding comfort requirements of the poor. Pradhan Mantri Awas Yojana is an initiative by the Government of India, in which affordable housing will be provided to the urban poor, with a target of building 20 million affordable houses by 31 March 2022 (Ministry of Housing and Urban Affairs Government of India, n.d.).

The book ends 30 years in the future, 2050, where Sumesh is still in Pune, India and Fairconditioning has been properly implemented. Using the resources provided by Vivek and the Fairconditioning project he has built his first home in an efficient manner and invited his family to live there with him. In a video call with Ellie and Dominick, he shows them his new living rooftop covered in vegetation. The children immediately recognize the cooling potential of the living roof and as young professional adults at this point, celebrate the cooling efficiency with their friends.

The purpose of the book is to engage young people in global issues and spotlight issues that some cultures take for granted, such as American children and air conditioning. We hope that this story inspires young people to get involved in global issues and work to think creatively to problem solve. Our desire is for children who read this book to learn about one of the issues that come as a result of climate change and to understand that impacts go beyond just having air conditioning (something common in the US). In addition to learning about climate change impacts, it is also an introduction to the concept of energy inequality and climate justice with the hope of working towards different avenues to mitigate efforts to alleviate the stress of global warming.



Whether readers realize it or not they are simultaneously experiencing a story of socioeconomic and environmental stewardship, based on a very real people and efforts currently being put forth into sound development in the energy and cooling sectors. Reshaping the energy and cooling systems currently in place not only has immediate benefits but also provides multilateral encouragement of responsible development and stewardship. The beauty of “Ellie, Dominick, and the Very Hot, Super Enlightening, and Extremely Fun India Trip!” lies within the simplistic approach of taking such a complex multifaceted problem and presenting it through a simplistic story of kids visiting a friend and experiencing a shift in thought and cultural bias.

While each reader’s emotional outcome is highly variable after closing the last page of our book we believe each and every person will be left with some type of positive impact. One of the unique aspects of this children’s story that makes it truly a learning experience is how the authors introduced several key sustainable development concepts to the reader. Strategically embedded within the story itself or inferred from the story line are brief discussions about several sustainable development goals which are explained in more detail below including: Poverty (SDG 1); Good Health and Well-being (SDG 3); Affordable Clean Energy (SDG 7); Reduced inequality (SDG 10); Responsible consumption & production (SDG 12) and Climate Action (SDG 13). These concepts are described in detail below.



No poverty

Target 1.4: Ensuring that all men and women, in particular the poor and the vulnerable, have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property, inheritance, natural resources, appropriate new technology and financial services, including micro-finance by the year 2030

The goal of SDG 1, “Ending poverty in all its forms everywhere” is weaved throughout the narrative of the story. Its importance is predicated on India’s challenge of having two-thirds of the population (68.8%) living on less than \$1.90 a day which by U.N. terms is classified as extreme poverty. Focusing on this issue, the Indian government is addressing this challenge, improving the economy and lifting 271 million people out of poverty between 2006 and 2016. As individual and family socioeconomic status change, disposable income increases and the desire to improve living conditions emerge. As a result, household ownership of air conditioning in India, 7% today, is expected to increase to over 1 billion by 2050. To put this in perspective, of the roughly 290 million households in India, fewer than around 20 million have air conditioners. Growth in the demand for cooling will be dramatic, particularly in urban areas, due to the underlying need for a solution to the problem of heat stress. Rising temperatures, population growth and urbanization are only going to worsen the problem of heat stress in cities (Radhika Lalit,).



Good Health and Well-being

Target 3.9: By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination

Immediately upon diving into the narrative of “Ellie and Dominick and the very hot, super enlightening and extremely fun India trip” readers get a taste of the importance of how this story intertwines with SDG 3: “Ensure healthy lives and promote well-being for all at all ages.” When Ellie and Dominick arrive in India and start to realize that not everyone gets to enjoy what some would consider a basic need, the two children are introduced to the concept of inequity. As part of their learning they are exposed to culture norms that are different from their experience. Ellie and Dominick start to ponder how individuals survive in such extreme heat without having technological advancements, such as air conditioners, to aid in keeping them cool. One reality that a lot of India residents are faced with is the constant threat of heat stress conditions inducing physical harm. As this region continues to experience increased heat waves, more residents are subject to increased risk of experiencing heat distress which can ultimately cause a ripple effect of entangling unforeseen economic and social impacts with it.



Affordable and Clean Energy

Target 7.1: By 2030, ensure universal access to affordable, reliable and modern energy services

With a majority of India’s infrastructure classified as informal structures, meeting SDG 7 poses serious challenges. Fairconditioning’s operational model engages with key stakeholders in order to produce desired impacts (either upstream, downstream, or both) that stimulates economic activity in a manner that aids in meeting the following sub goals of SDG 7.

Fairconditioning aims to partner and assist key stakeholders that hold a high degree of influence in India’s future landscape to make informed decisions that help curtail the cooling systems market into a more efficient state and lessen both physical and economic shocks associated with climate adaptation. In order to reduce rolling brownouts, lessen GHG emissions, alleviate economic disparity, and provide the groundwork for modern energy systems, Fairconditioning pioneers exploration of institutional, political, and consumer facets as key engagement areas.



Reduced inequality

Target 10.1: By 2030, progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average

Inequality is a central theme and the readers realize the extent as Ellie and Dominick untangle what they feel to be oddities of the cooling system at Sumesh's home. As the story unfolds and with Vivek's help, Sumesh and his friends learn ways to overcome socioeconomic status and keep cooling efficient for all to enjoy.

Throughout the book readers will notice subtle hints of inherent socioeconomic issues. Socioeconomic status, in India and most everywhere in the world, determines access to luxuries such as advanced cooling adaptation technologies. As Ellie and Dominick arrive at Sumesh's home they start to realize the inequity, as they can see that Sumesh's family has an air conditioning unit but it is not being utilized. During the brown out, Ellie and Dominick discover the neighbors have a generator to power their own electricity, further widening the gap. A lower socioeconomic status can feel the weight of disparity from a higher socioeconomic class that has access to climate adaptation strategies. Education and policy reform can serve as leverage points within a complex societal system and aid in shifting the distribution of wealth to a more equal pattern. Vivek was clear about this in his presentation and thus inspired Ellie and Dominick to bridge the gaps in their own culture.



Responsible consumption & production

Target 12.2: By 2030, achieve the sustainable management and efficient use of natural resources

The goal of "Ensure sustainable consumption and production patterns" (SDG #12) is part of the ideology of the book in order to exemplify the problematic patterns in today's energy sector and to question current practices, beliefs, and trends that led to the formation of non (sustainable) approaches in the first place. Readers are encouraged to make an intrinsic link between the conundrum of current electrical systems and energy overload and be forced to ponder whether traditional energy and cooling systems are really practical.



Climate Action

Target 13.2: Integrate climate change measures into national policies, strategies and planning

SDG 13: "Take urgent action to combat climate change and its impacts" is a pivotal theme in the story as the children are exposed to situations in an energy insecure setting. India is a vulnerable country to climate change and the author's want to raise awareness of not only current challenges but also how

it impacts the future. They learn from Nani the changes that have happened since she was younger and are introduced to the growing problem that will have greater future impacts. As we learned from studies by the World Economic Forum, the increased demand for air conditioners over the coming years will go from 50 million to 200-300 million by 2035 driving the GHG emission through the roof .5 degrees celsius. Vivek's approach through Fairconditioning aims to tackle the problem at the source. By creating and implementing more efficient building and architecture plans, the stress on the energy system (and by extension the GHGs emission) can be minimized thus removing the need to put a band-aid on the problem.

LINK TO BOOK [HERE](#)

LESSONS LEARNED:

Alex - This project was loooooonnggg but oh so worth it. One key takeaway from this project for me was that “the shoe doesn’t always fit”. Like many other projects we’ve accomplished over the last months the Fairconditioning project really stood out to me as specifically in regards to how education is being utilized to teach upcoming architects and engineers that just because something works well in one region doesn’t mean it’ll work well in another. As far as our novel goes, a key teachable moment for me is that there are ways to refine extremely complex and intricate environmental issues into a form where even young kids can grasp key concepts of a big problem. In doing so I think the chances of coming up with a solution to these problems are greatly increased as sometimes you need the “simple man” solution to solve some of the hardest problems. Lastly, I learned from Vivek that I need to take more happy days off.

Beth - This project was ambitious, perhaps too ambitious for the time and bandwidth we had but in the end the outcome justified the effort. Yes, what Fairconditioning is trying to accomplish is incredibly complicated, it's a complete rework of a system but it's also an introduction of a new way of thinking. While I was not the one to suggest a children's book for a project (100% credit to Jodi) I enthusiastically raised my hand in support of the idea. I think there is a way to take overly complicated issues and strip them down to their basic elements to help articulate why there's a problem. In this story, Ellie and Dominick are exposed to issues that are not present in their everyday life and (being curious children) they seek answers and long for understanding. It was important to us that this book reflect exposure to issues and concepts and not have an ending that projects the idea of American kids coming in to save the people of India.

I'm truly going to miss these projects and my team. I feel of all the projects we've worked on this year, this one stirred up the most debate and conversations about alignment of goals. We hit the project from both lanes (the children's book + prequel) and it took many conversations and debates about what to include, what to cut, and how to pivot when we got off track.

Jodi - I so enjoyed this project. I appreciate the freedom to be able to tell a story to our intended audience. While a children's book may seem out of context for such a wicked problem, I am passionate that children and youth learn things such as this when they are young and still have his/her sense of wonder. It is the young and creative mind that could change sustainability issues, especially within his/her lifetime. While writing this for children, I learned the importance of including young people in problems that may seem too large. As an educator, this is specifically relevant to me as I continue to seek ways to motivate and encourage young people to be active participants in the world around them.

I also enjoyed working together with my team on this one. The level of creativity and intensity brought us to our zenith of output and I am very proud of what we have done. Each person in the group brings so much to the table and each meeting made the project that much better. We all worked much more than the allotted time, as something like this requires much effort than that which academia fluff would otherwise cover over. Couldn't be more proud to end on this fun, lively and impactful note with such a great group of people!

Luz - Although at first, I was bummed for not having worked on the project "Saving tigers with electricity", I want to highlight that I enjoyed this project very much, from conception of the idea through final delivery. It personally moved me and brought back lived experiences of my childhood in my homeland.

Working on this topic for two straight months I was able to re-grasp the linkages of a few SDGs embedded on this fascinating but challenging matter. To the point that Fair conditioning has been, along with Vivek Gilani, the inspiration for my Ted Talk.

From the beginning, my team established the goals and we committed ourselves according to our abilities and skills to shape the children's book which tells a real story. We as a team are incredibly happy and proud of our final product.

Ziggy - This project was enlightening. Taking a complex program like Fairconditioning and creating an educational tool around it was challenging. Using the prequel to explain the more technical aspects of the program helped me understand the complex nature of the assignment. What I enjoyed most was our interaction with the cohort and the speakers such as Vivek Gilani. The challenges with adding over 1-billion residential air conditioning units and cooling businesses including the stress on the energy distribution and generation system if not controlled will be immense. It is also evident that through technology, innovation and human ingenuity the solutions exists. Great project from a learning opportunity perspective.

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STAKEHOLDERS

	Low Interest	High Interest
High Influence	USAID UNEP Ministry of labor and employment	cBalance Noe21 Vivek Gilani BFF Indian Green Building (GRIHA) Shakti Sustainable Energy Foundation Ministry of Power Raj Kumar Singh Confederation of Indian Industries Gov of India EESL BRPL ISHRAE SSSCC The Indian Real Estate Ecosystem BEE CREDAI IGBC IIA Fair Conditioning Team
Low Influence	Frankfurt School of Management	Residents MoEFCC BSES

	SIDBI CERC AEEE CEEW NASSCOM Geneva Office The Oak Foundation	Dept of Science and Technology AEEE CEEW TERI NRDC
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Stakeholder	Influence/ Interest	Upstream	Direct	Downstream and Use	Enabled Impacts
USAID	High Influence Low Interest				X Finance/ governance
UNEP	High Influence Low Interest				X
Ministry of labor and employment	High Influence Low Interest	X			X
cBalance	High Influence	X			

	High Interest				
Noe21	High Influence High Interest	X			
Vivek Gilani	High Influence High Interest	X			
BFF	High Influence High Interest				X
GRIHA	High Influence High Interest				X
Shakti Sustainability Energy Foundation	High Influence High Interest				X
Ministry of Power	High Influence High Interest		X		
Mr. Piyush Goyal	High Influence		X		

	High Interest				
Confederation of Indian Industries	High Influence High Interest				X
Gov of India EESL	High Influence High Interest		X		
BRPL	High Influence High Interest		X		
ISHRAE	High Influence High Interest		X		
SSSCC	High Influence High Interest	X			
The Indian Real Estate Ecosystem	High Influence High Interest	X			
BEE	High Influence	X			

	High Interest				
IGBC	High Influence High Interest	X			X
IIA	High Influence High Interest				
Fair Conditioning Team	High Influence High Interest	X			
Frankfurt School of Management	Low Influence Low Interest	X			
SIDBI	Low Influence Low Interest	X			
CERC	Low Influence Low Interest	X	X		
AEEE	Low Influence				X

	Low Interest				
CEEW	Low Influence Low Interest				X
NASSCOM	Low Influence Low Interest		X		
Geneva Office	Low Influence Low Interest	X			
The Oak Foundation	Low Influence Low Interest				X
Residents	Low Influence High Interest			X	
MoEFCC	Low Influence High Interest				X
BSES	Low Influence	X	X		

	High Interest				
Dept of Science and Technology	Low Influence High Interest	X			
AEEE	Low Influence High Interest				X
CEEW	Low Influence High Interest				X
TERI	Low Influence High Interest	X			X
NRDC	Low Influence High Interest				X

Impacts:

1. Financial - Upstream
2. Architects/ builders/ engineers - direct
3. Residents - Downstream/ use and enabled impacts
4. Businesses - enabled impacts
5. Manufacturers of equipment - direct
6. Government agencies - upstream

7. Education - upstream

Stakeholder bucket	Impact	Strategies
Financial	Upstream	Finance and Investment
Architects/ Builders/ Engineers	Direct	Technology/ Innovation
Residents	Downstream/ Use and Enabled Impacts	Market Fixes
Businesses	Enabled Impacts	Market Fixes/ Changing Consumer Behavior
Manufacturers of Equipment	Direct	Technology/ Innovation
Government agencies	Upstream	Governance and Regulation and Property Rights and Market Fixes
Education	Upstream	Technology/ Innovation