

The Case for Comfort

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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

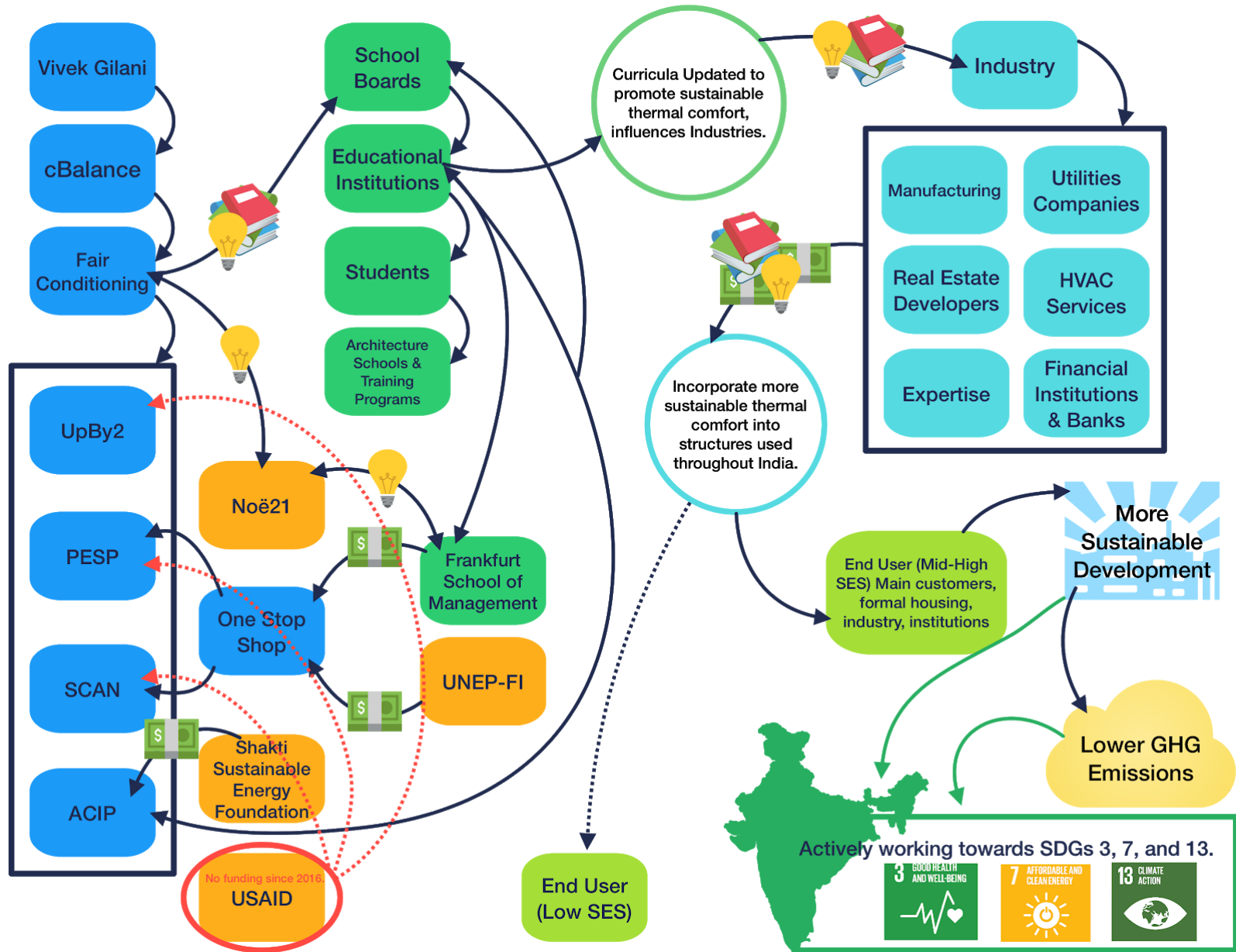
Stakeholder	Goals	Strategies	Influence	Interest	Impact
Funding					
Shakti Sustainable Energy Foundation	<ul style="list-style-type: none"> - To see Fair Conditioning efforts take off and influence change across architecture educational institutions and building codes. - For India to enter a cleaner 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.