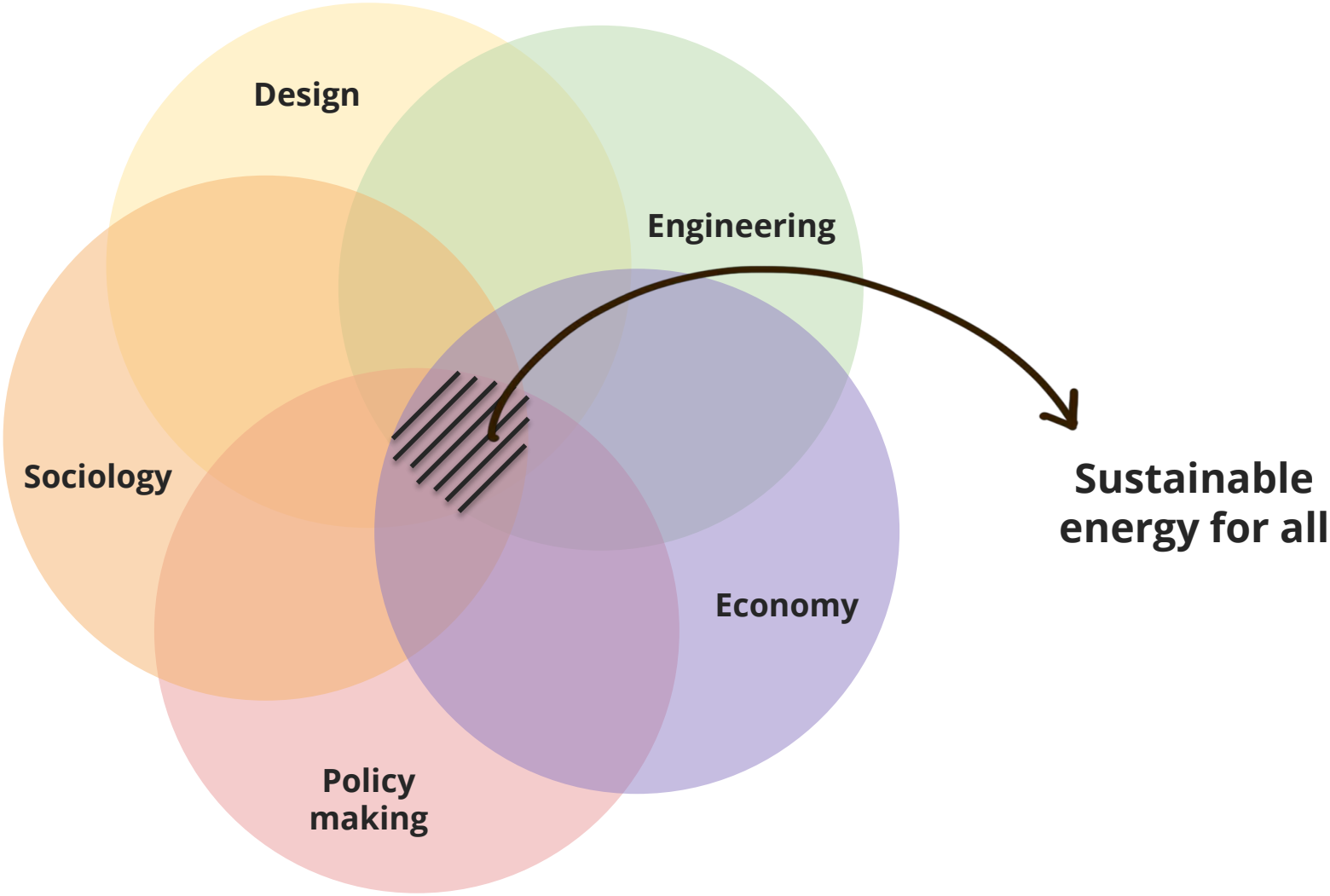
LOW ENERGY LIFESTYLES FOR SUSTAINABLE LIVING:

Promoting Conscious and Efficient Energy consumption

Priyam Vadaliya, Bhuvana Sekar
Anupreeta Agate, Mridula Dasari
Prof. Praveen Nahar

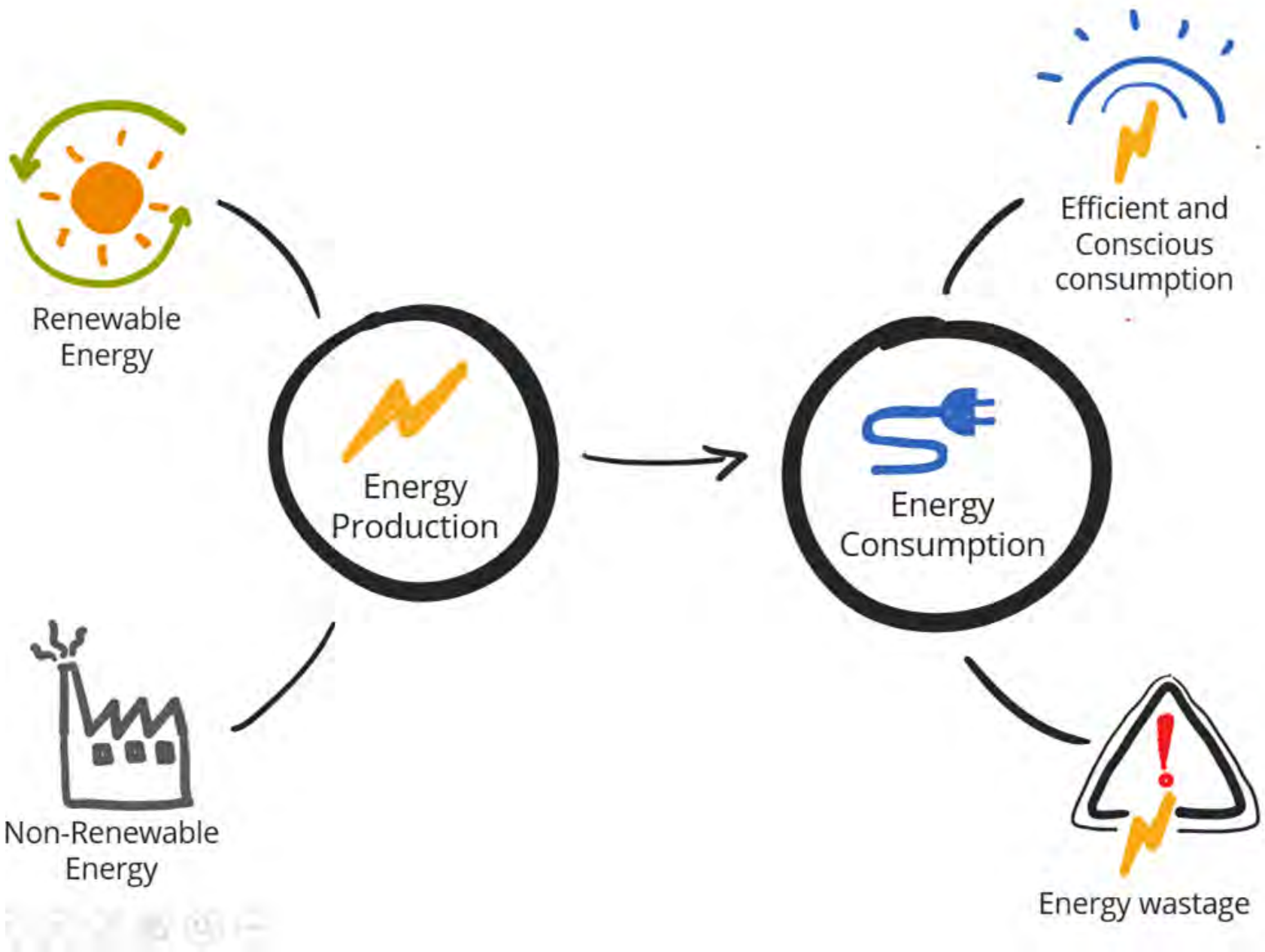
National Institute of Design, India

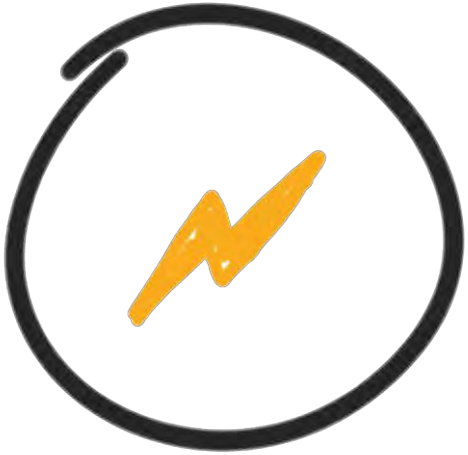

Design
Engineering
Sociology
Economy
Policy
making
Sustainable
energy for all

SE4ALL

By promoting
Low-Energy Lifestyles
for efficient and conscious
energy consumption

How can we improve Energy Efficiency ?


Renewable Energy
Non-Renewable Energy
Energy Production
Energy Consumption
Efficient and Conscious consumption
Energy wastage

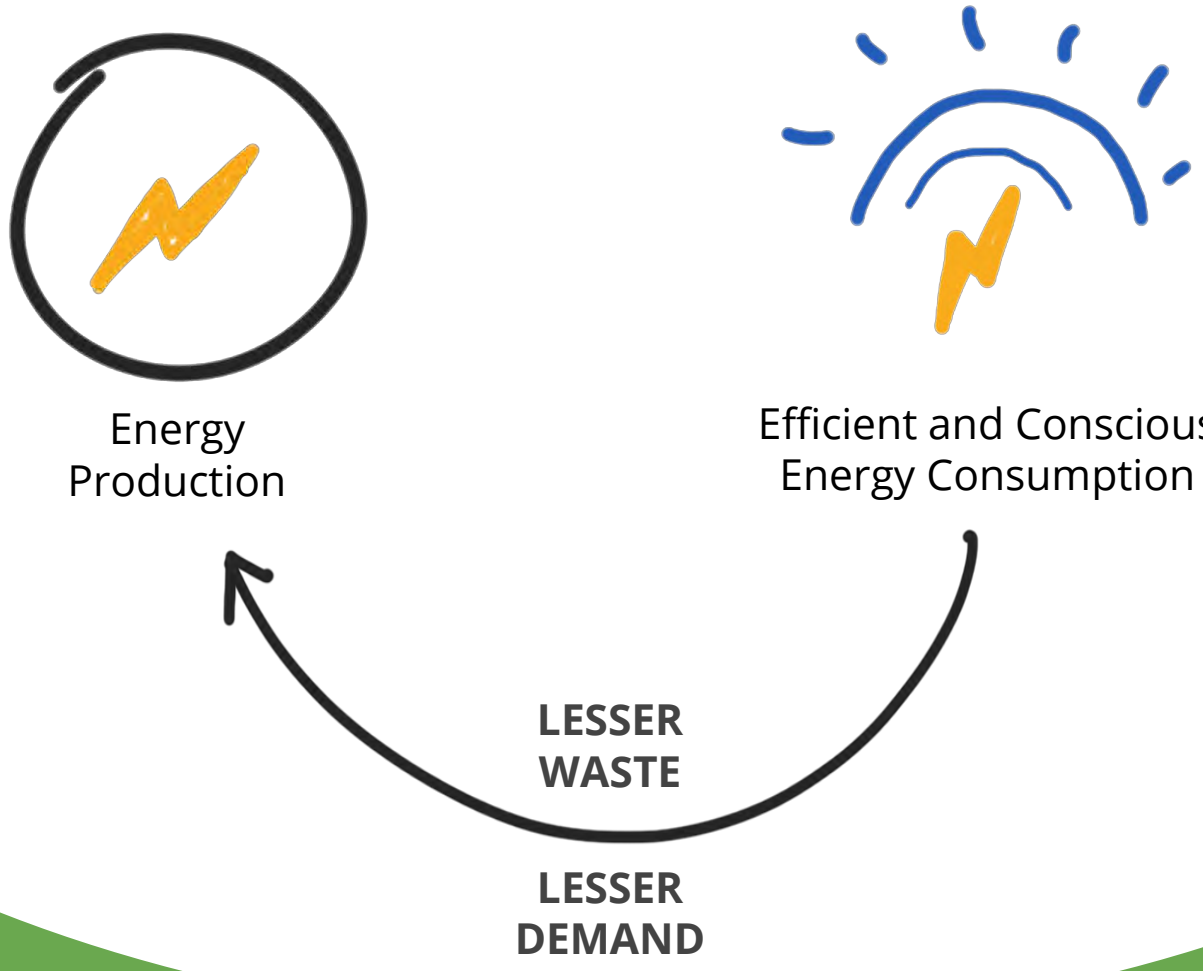


Energy
Production

Efficient and Conscious Energy Consumption

LESSER WASTE

LESSER DEMAND



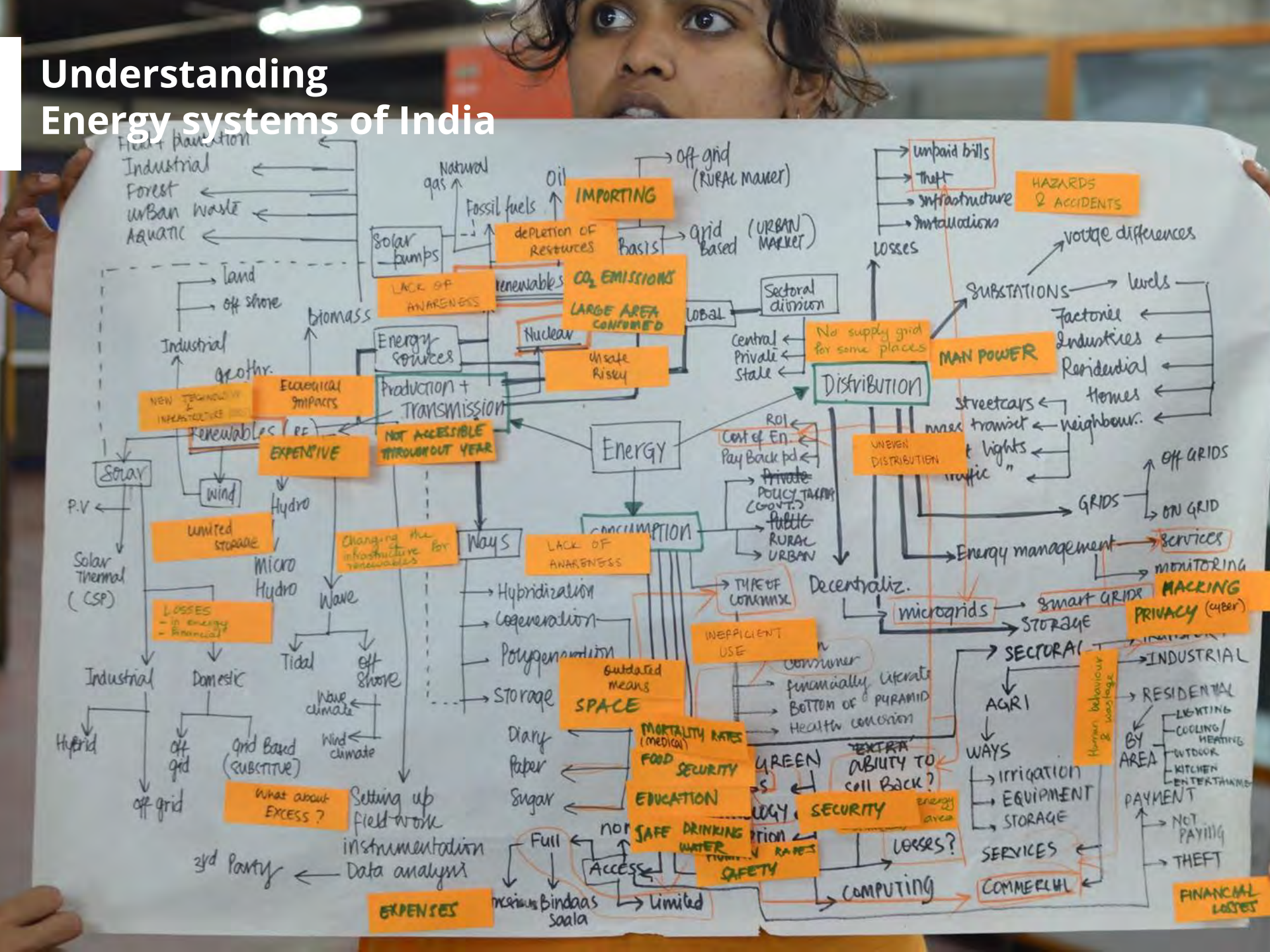
Lesser waste of valuable resources

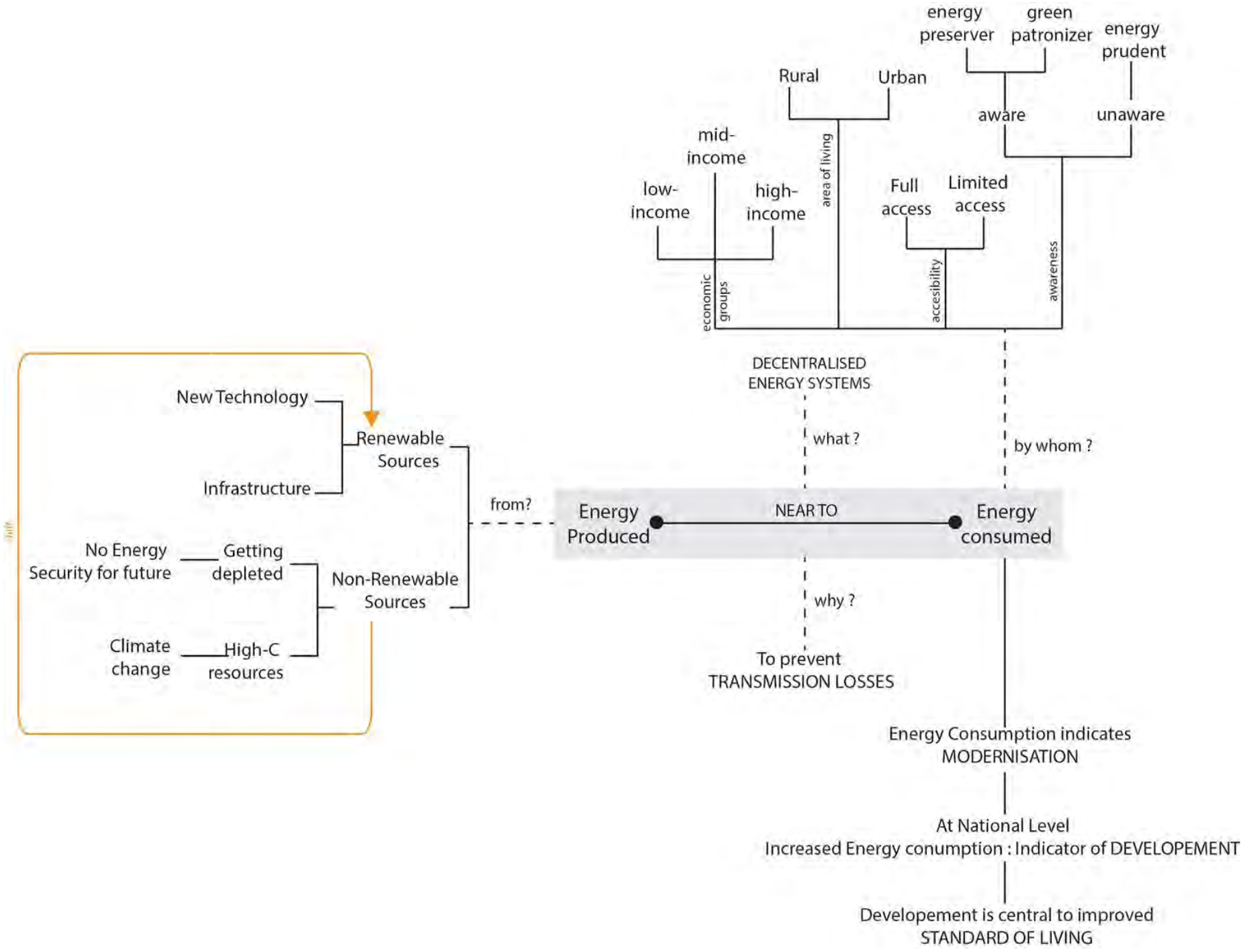
BETTER IMPACT ON ENVIRONMENT AND SOCIETY

Promoting Low Energy Lifestyles for efficient Energy Consumption through

"Systems Oriented and Design Thinking Approach"

Understanding Energy systems of India




energy preserver
green patronizer
energy prudent
Rural
Urban
aware
unaware
mid-income
low-income
high-income
area of living
Full access
Limited access
economic groups
accesibility
awareness
DECENTRALISED ENERGY SYSTEMS
what ?
by whom ?
New Technology
Renewable Sources
Infrastructure
from?
Energy Produced
NEAR TO
Energy consumed
No Energy Security for future
Getting depleted
Non-Renewable Sources
Climate change
High-C resources
why ?
To prevent TRANSMISSION LOSSES
Energy Consumption indicates MODERNISATION
At National Level
Increased Energy conumption : Indicator of DEVELOPEMENT
Developement is central to improved STANDARD OF LIVING

Research and Analysis

Primary research

Research through internet, white papers and books

Research on energy systems, numbers and figures on world energy consumption, study on India's energy situation

Secondary research

Visiting Gujarat Vidyapith University, Mega Trends Road Show (Ahmedabad), Renewable Energy Expo (Noida)

Discovering ongoing activities in the domain of renewable energy solutions at the ground and community level and technological level.

Ethnography Study

One on one informal interviews

Talking to people from various socio-economic backgrounds, aided by various design methods and toolkits, mapping behaviour patterns and usage trends

Running parallely ←

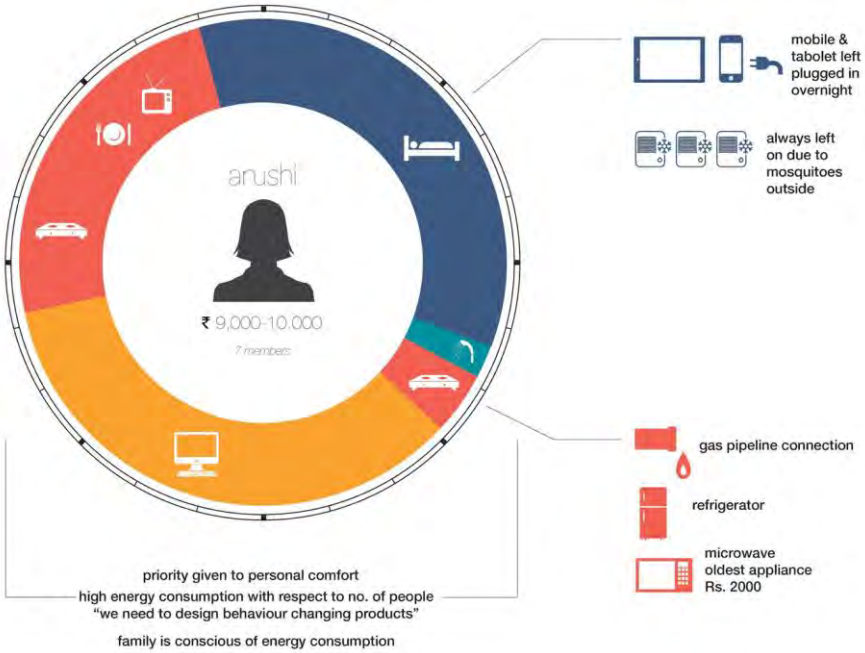
Data Analysis and Insight Collation

Studying data, identifying patterns, gaps and opportunities

→ *Running parallely*

Persona Study

"Day in a life of person" **–** People from different socio-economic background were asked about their 24 hours average activity cycle.



As aspirations of *a better standard of living* gets higher, energy consumption also increases.

Energy certifications and 'starts' are like an *ornamental addition* to the product.

Diversified socio-economic backgrounds suggested **different behaviour patterns** and **thoughts** about Energy consumption

Energy saving is perceived as *sacrificing comfort and luxury*, and in some cases safety as well.

Energy 'talk' is *limitedly perceived* to 'My home, My lights'.

Money matters.
It is a big driving factor and motivator.

While the energy is *used by multiple people*, the paying of bills, looking at meter reading etc. generally is done by a *single person*.

The whole aspect of *"If I don't live comfortably now, then when?"* is intrinsically linked to the amount and the way energy is used.

Habits encouraged during *childhood* become engrained and change the perception of energy usage.

Living in joint families *doesn't necessarily mean* than 'same' activities were done together.

The *major driving factors* observed were : Money, Ease of use and Social image.

Environment and surroundings play a major role in our habits .

Identifying Personas

Different **"Personas"** were identified and categories were formed on the basis of following identified factors:

Awareness (about efficient energy consumption)
Willingness (to switch to smarter and conscious energy consumption habits)
Choices Available (financially or geographically)

Categories of Personas

- Awareness
- Willingness
- Options

Factors affecting Personas

Qualitative factors

Ability to change
Curiosty
Awareness
Income / Expenditure
Skills & knowledge
Community connectedness
Living habits

Quantitative factors

Outside temperature
Home characteristic
Number of people
Appliances used

Learning from Case-studies

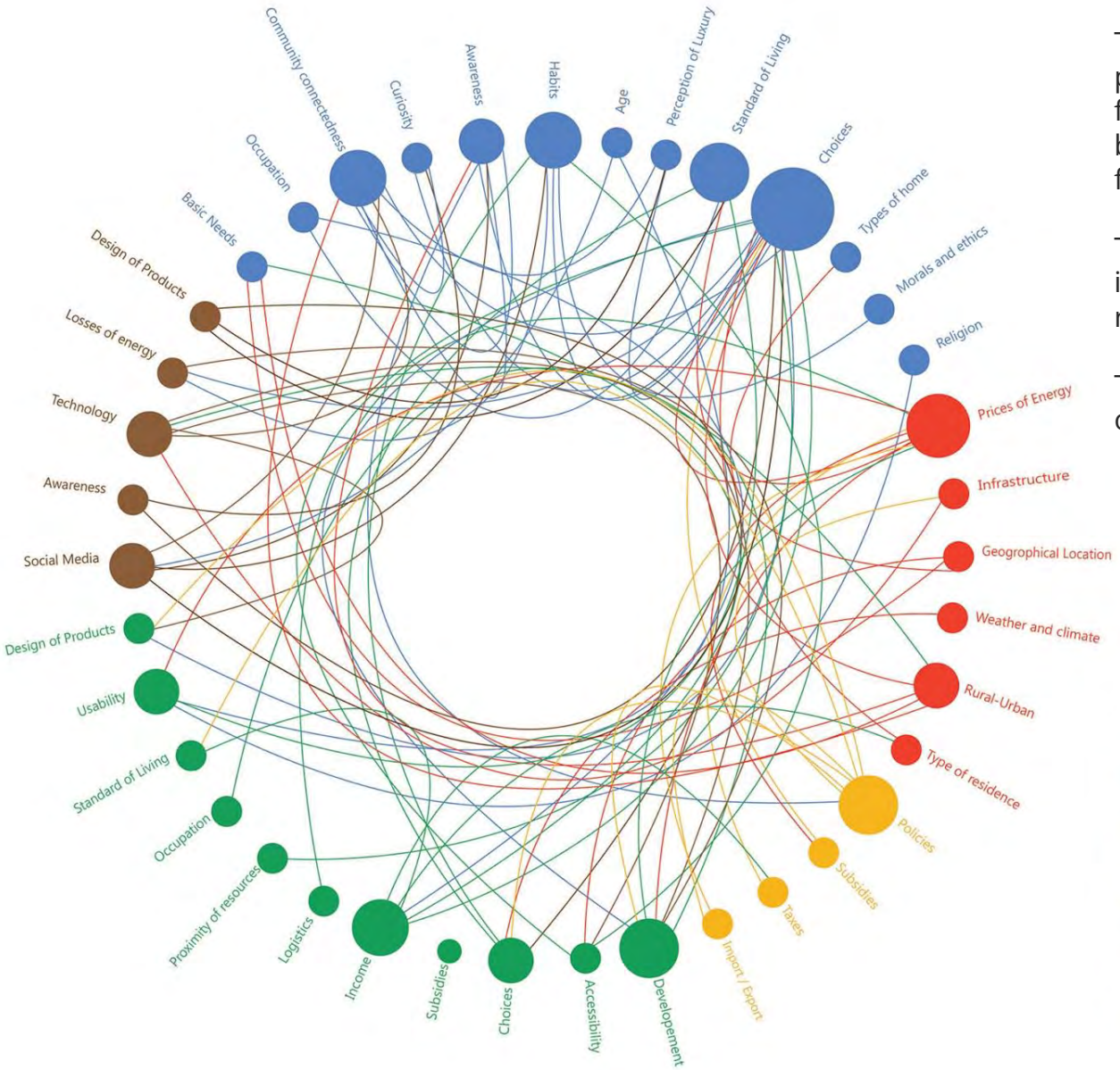
Case-studies helped in understanding the global perspective around Sustainable Living and different kinds of work happening around Low-Energy lifestyles in various contexts

Influential factors related to Energy Consumption

From all the research and analysis, different **factors influencing Energy Consumption** were identified.
These factors were in a way affecting the users and the Energy systems.

The factors were grouped into 5 main categories:

- **Social**
- **Regional**
- **Political**
- **Economical**
- **Technological**



To identify the factors with higher priority and influence, all the factors were interlinked on the basis of their impact on every other factor.

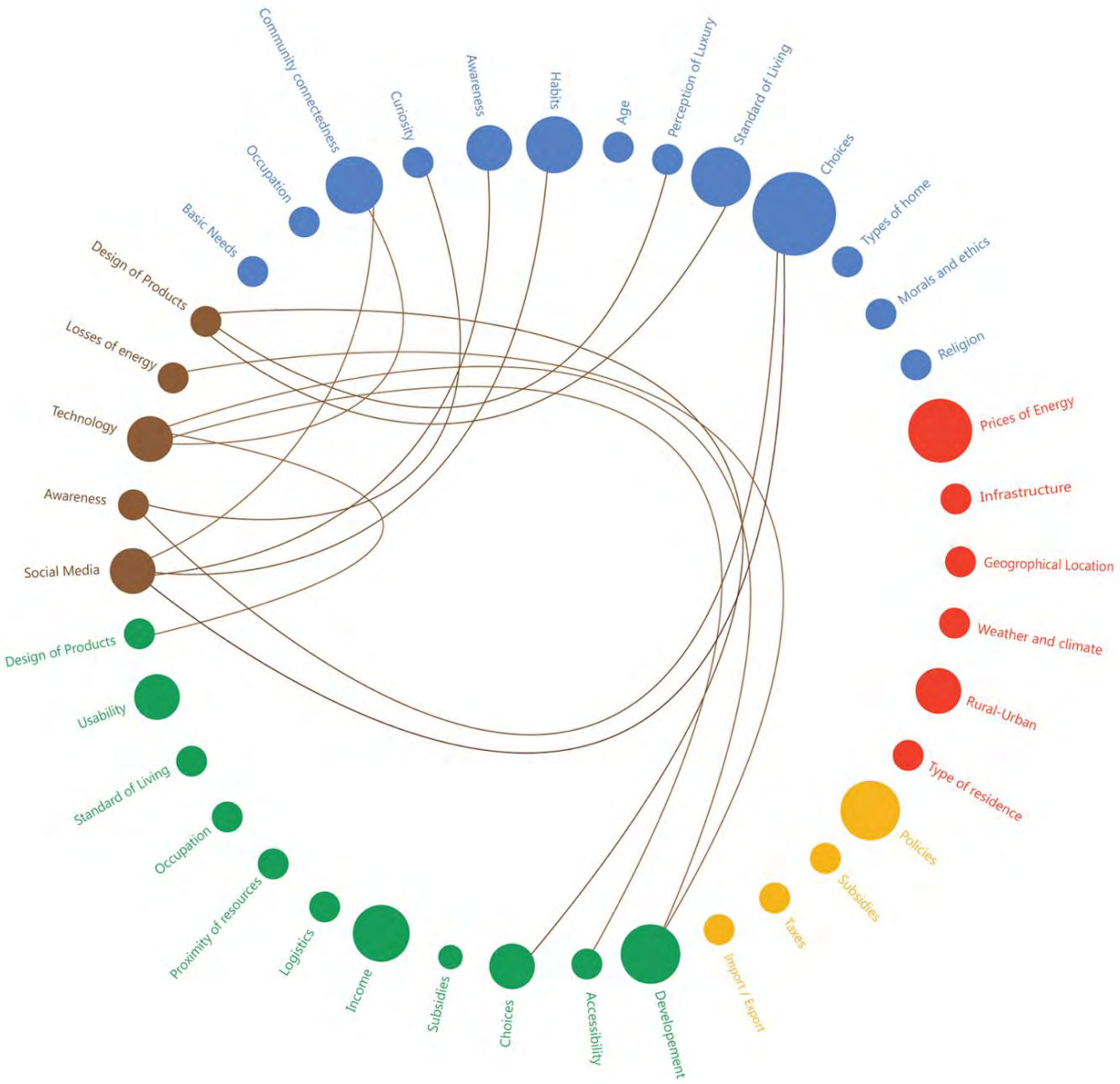
This figure here shows all the interlinkages between the factors related to energy consumption

The most dynamic factors were the ones which:

1. Impacted most number of other factors
2. Were impacted by most number of other factors.

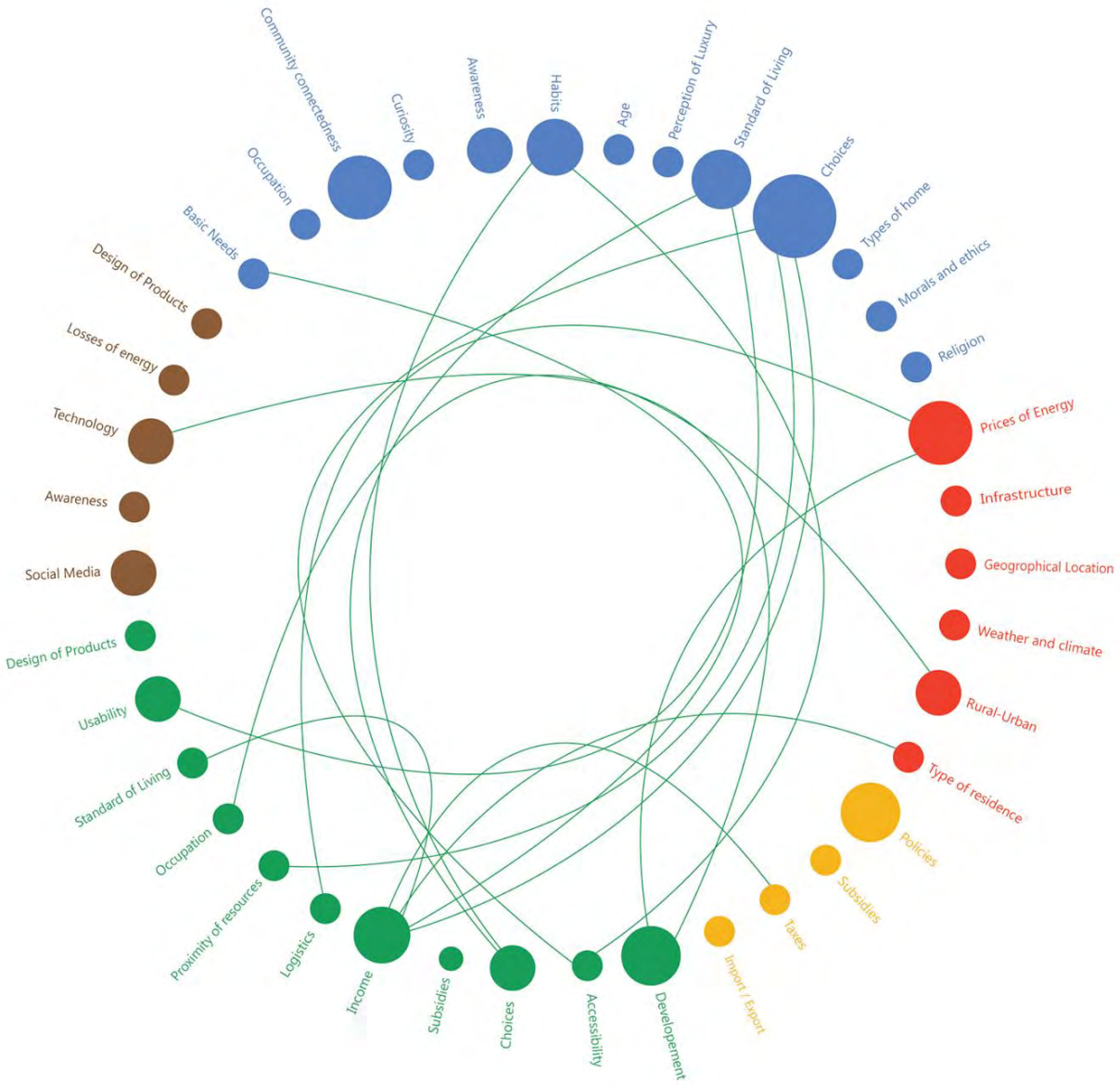
Categories

- Social
- Regional
- Political
- Economical
- Technological

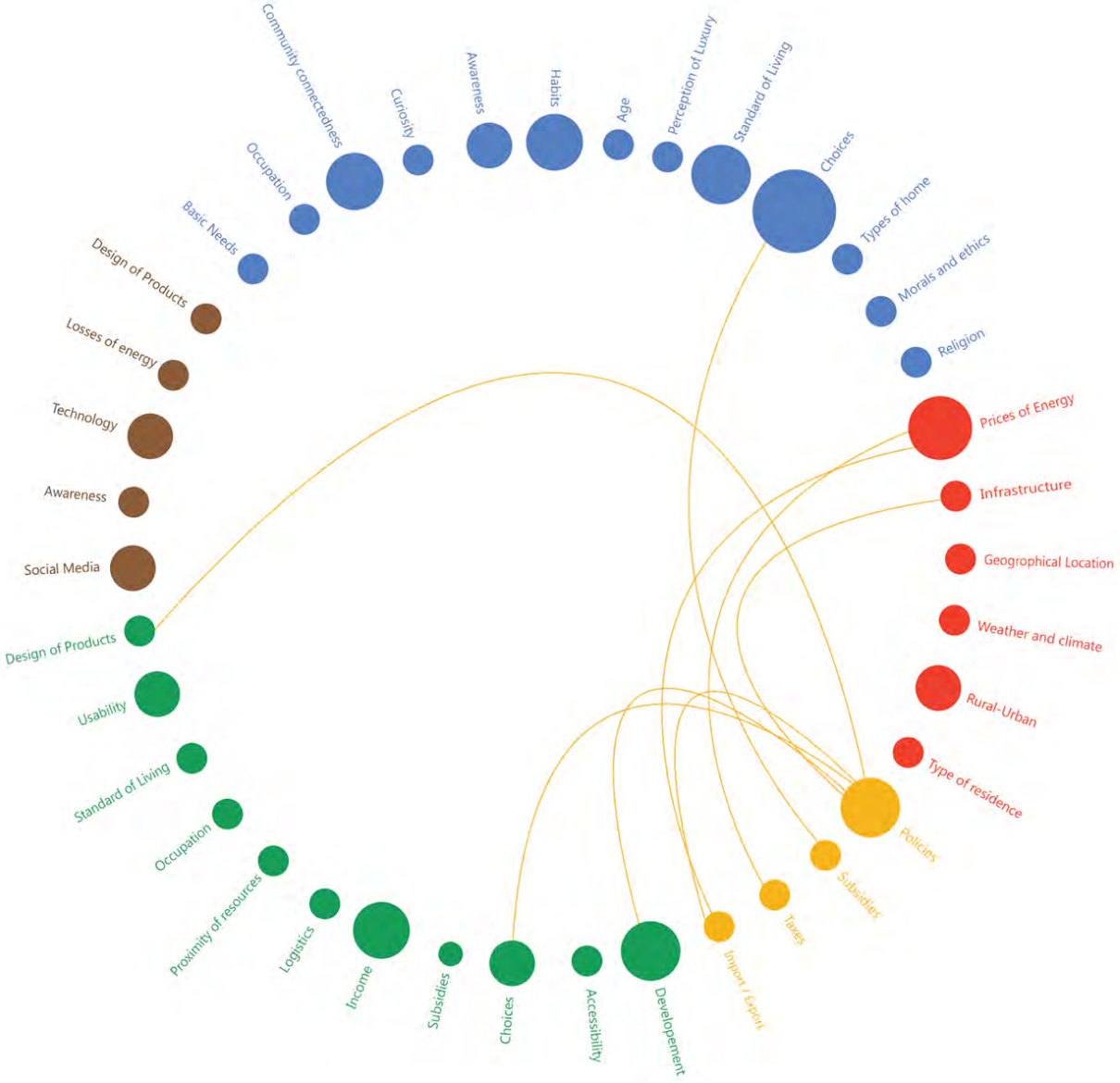


TECHNOLOGICAL

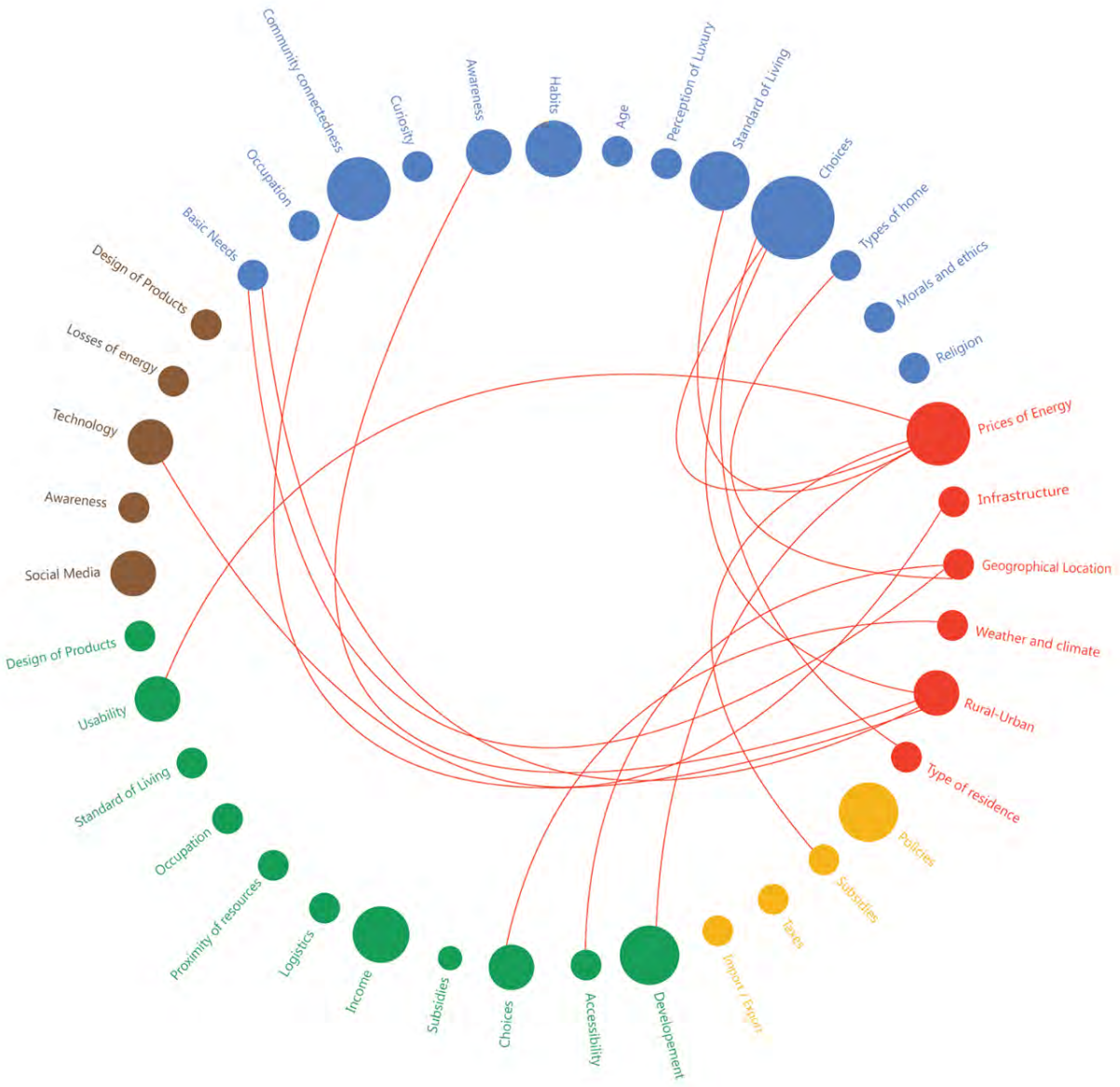
For example here, this figure shows the interlinkages of all the factors of technology category with other factors


Community connectedness
Curiosity
Awareness
Habits
Age
Perception of Luxury
Standard of Living
Choices
Occupation
Basic Needs
Types of home
Morals and ethics
Religion
Design of Products
Losses of energy
Technology
Prices of Energy
Awareness
Infrastructure
Social Media
Geogrophical Location
Design of Products
Weather and climate
Usability
Rural-Urban
Standard of Living
Type of residence
Occupation
Policies
Proximity of resources
Subsidies
Logistics
Taxes
Income
Import / Export
Subsidies
Choices
Accessibility
Developement

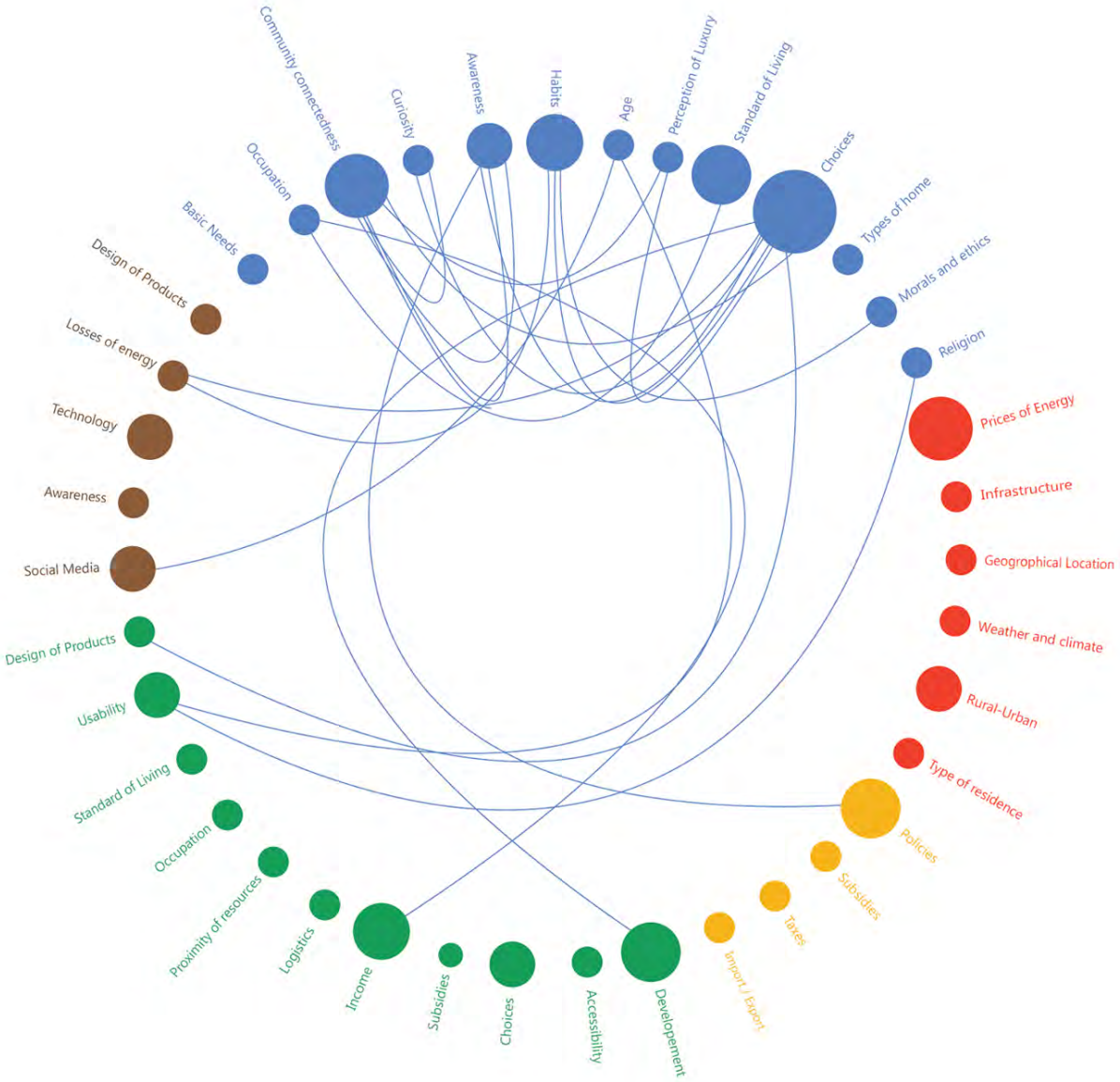
ECONOMICAL


Community connectedness
Curiosity
Awareness
Habits
Age
Perception of Luxury
Standard of Living
Choices
Occupation
Basic Needs
Types of home
Morals and ethics
Religion
Design of Products
Losses of energy
Technology
Awareness
Social Media
Design of Products
Usability
Standard of Living
Occupation
Proximity of resources
Logistics
Income
Subsidies
Choices
Accessibility
Developement
Import / Export
Taxes
Subsidies
Policies
Prices of Energy
Infrastructure
Geogrophical Location
Weather and climate
Rural-Urban
Type of residence

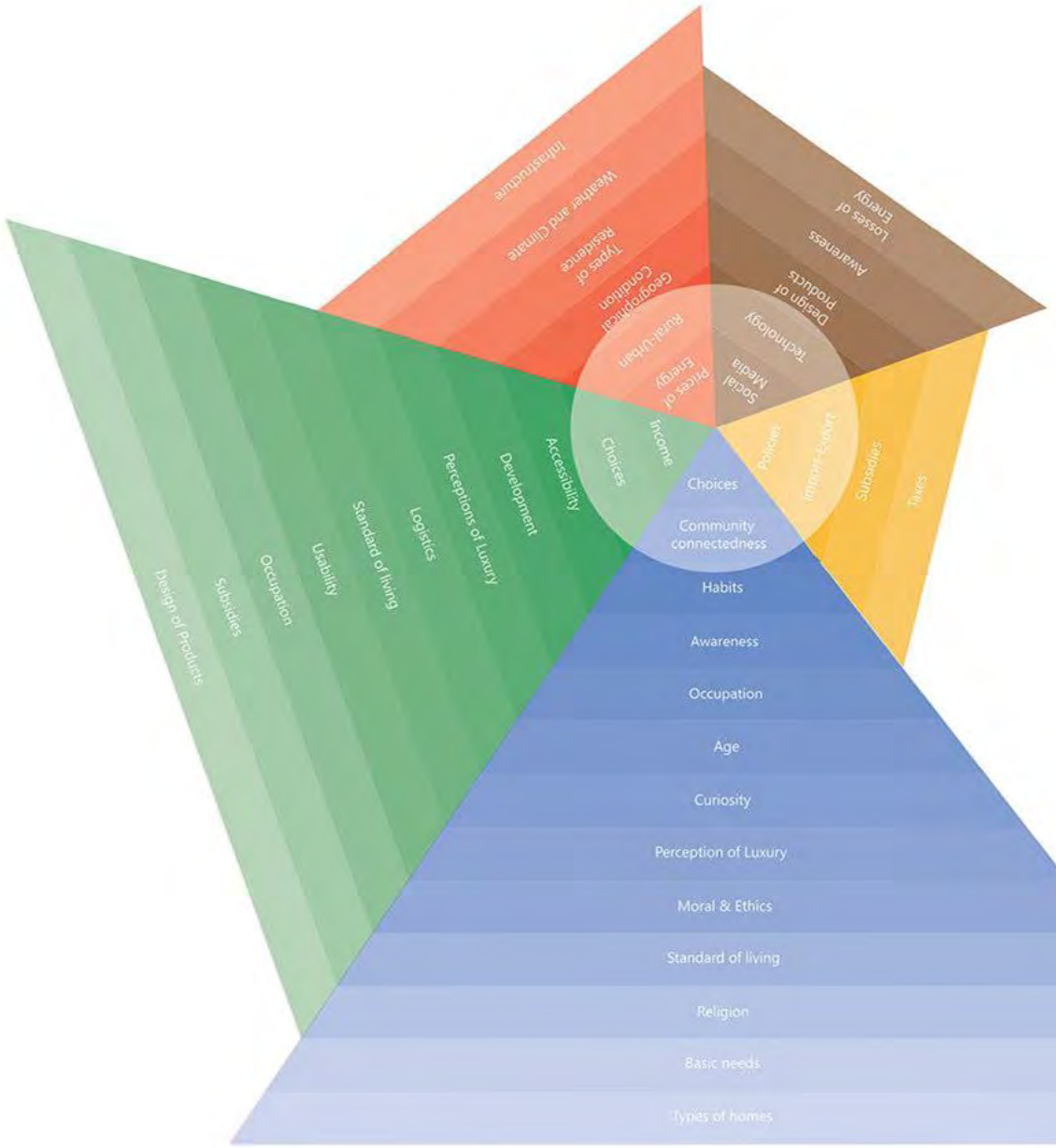
POLITICAL


Community connectedness
Curiosity
Awareness
Habits
Age
Perception of Luxury
Standard of Living
Choices
Occupation
Basic Needs
Types of home
Morals and ethics
Religion
Design of Products
Losses of energy
Technology
Prices of Energy
Awareness
Infrastructure
Social Media
Geogrophical Location
Design of Products
Weather and climate
Usability
Rural-Urban
Standard of Living
Type of residence
Occupation
Policies
Proximity of resources
Subsidies
Logistics
Taxes
Income
Import / Export
Subsidies
Development
Choices
Accessibility

REGIONAL


Community connectedness
Curiosity
Awareness
Habits
Age
Perception of Luxury
Standard of Living
Choices
Occupation
Basic Needs
Types of home
Design of Products
Morals and ethics
Losses of energy
Religion
Technology
Prices of Energy
Awareness
Infrastructure
Social Media
Geographical Location
Design of Products
Weather and climate
Usability
Rural-Urban
Standard of Living
Type of residence
Occupation
Policies
Proximity of resources
Subsidies
Logistics
Taxes
Income
Import / Export
Subsidies
Choices
Accessibility
Developement

SOCIAL



Forming the Impact Board

An impact board was created with the most influential factors found, towards the centre and the least influential factors towards the periphery.

Choices, Community Connectedness, Prices of Energy, Habits and Rate of Development are few of the most influential factors (most prominently dominant factors).

If a solution was found to be impacting either of these dominant factors, it would positively impact a maximum number of other factors due to a ripple effect.

Key Insights and Learnings

Energy saving is perceived as sacrificing comfort and luxury

"If I don't live comfortably now, then when (can I)?"

"Being sustainable means I will have to sacrifice some comfort (and status, in some cases) while others might not do so."

"Do my actions contribute to any differences...? "

Major Action Triggers and Motivators

Things that enables one to get ' right action at the right time.

Receiving feedback about actions performed to save energy

Doing things together is a bigger motivator than saving money

Involvement of children

Key system design oriented questions:

1. How could children (and people) today become the flag-bearers of this clean, sustainable energy economy?

2. How could small inspiring examples of sustainable energy living people and places today inspire others and help them adopt and scale up such practices?

3.How could people with an access energy transition to better cleaner, sustainable energy models and people without basic energy be able to access clean, safe and continuous energy?

Proposed Concepts and Solutions

Feedback Methods

through personal energy management

USING LESSER

WHAT

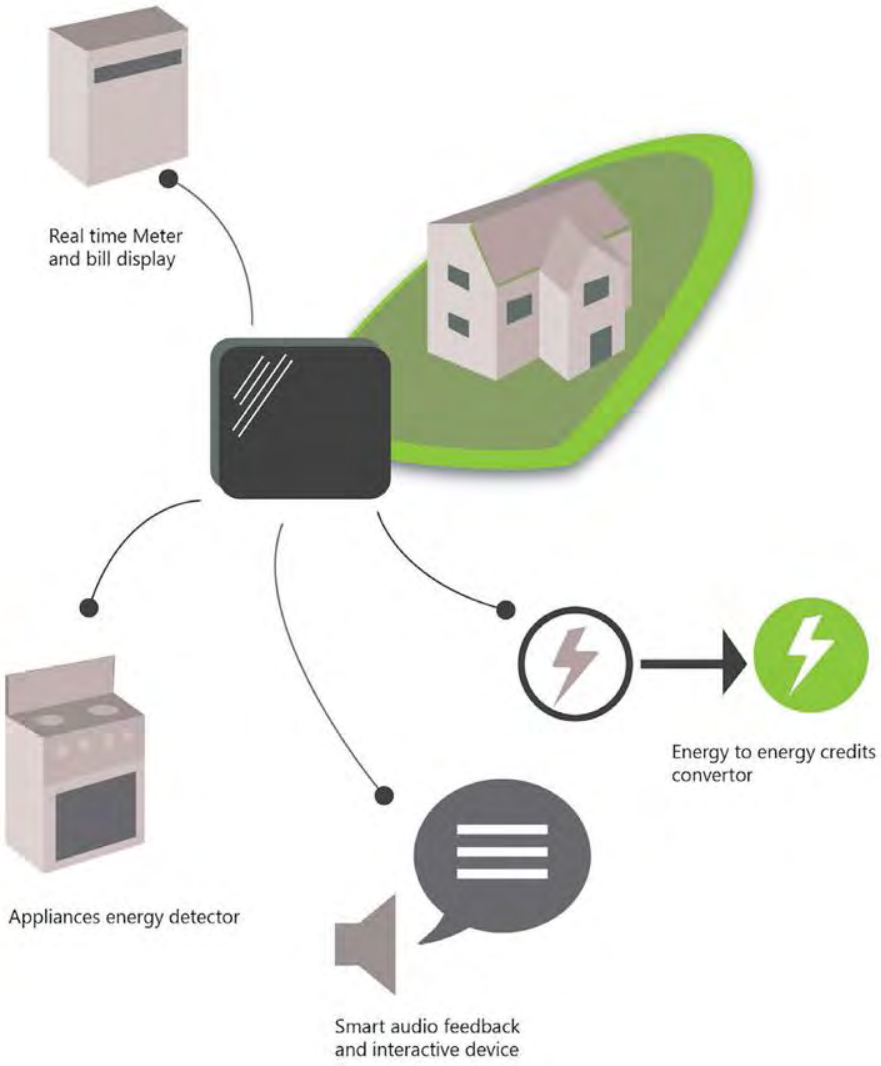
- real time data access through phone
- programmable, smart devices
- customizable alerts (for time, frequency etc.)
- real time date for community
- a subset of energy doctor

WHY

- need for regulating consumption
- real time information to facilitate awareness

IMPACT

- awareness & comparison
- trigger for a self coscious initiative



USING LESSER

Feedback Methods
through energy bills

WHAT

- price centric energy bill
- energy tips linked to prices
- long term consumption graph
- a helpline linked for personalized information (energy doctor)
- mid-month alerts

WHY

- need to create awareness through feedback
- need for regulating consumption

IMPACT

- awareness and comparison with society
- possible increase in community conenctedness
- trigger for self-conscious initiative
- use of data for energy providers

USING LESSER

Providing Incentives

to imbibe a low energy lifestyle

WHAT

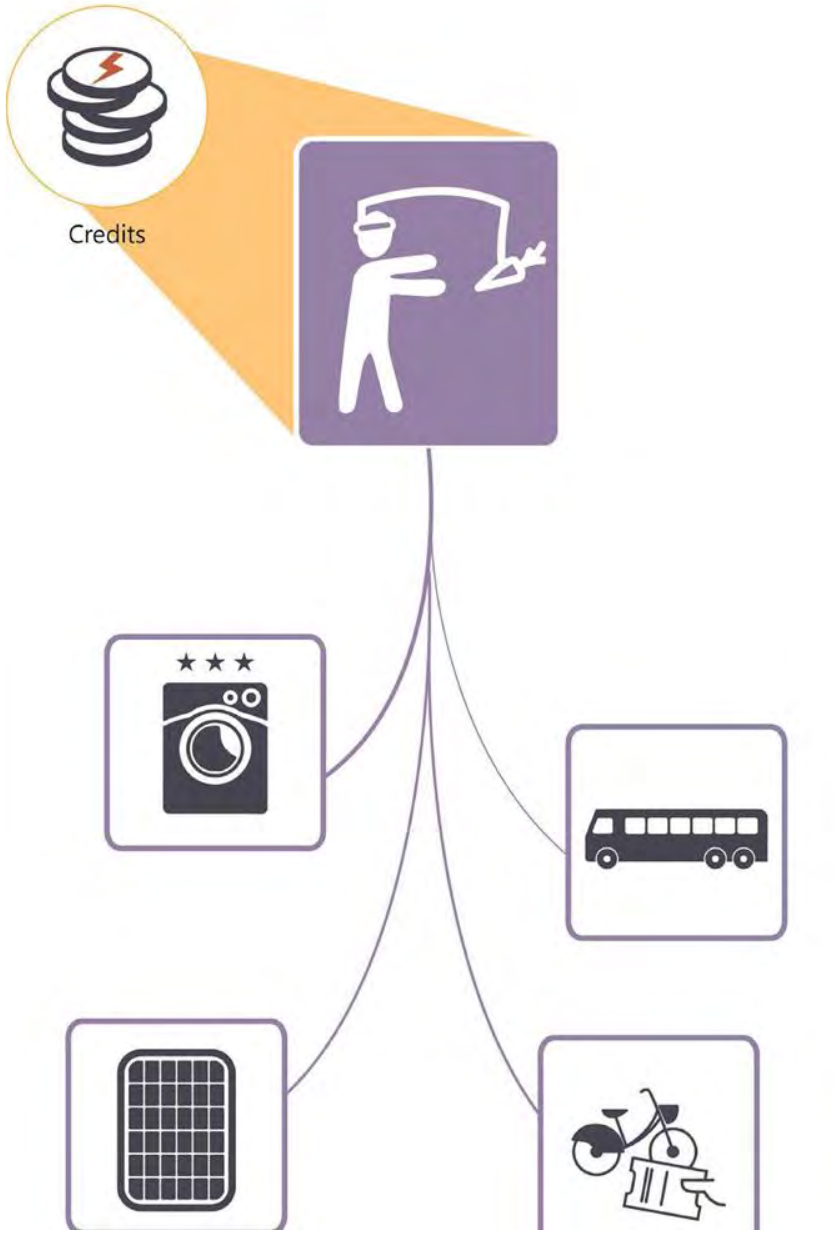
- need for curiosity and motivation
- long term potential in changing behaviour

WHY

- energy credits earned
- can be availed on energy star appliaces, green energy infrastructure, public transport, waste management

IMPACT

- motivation
- accelerate the transition to sustainable cities
- greener lifestyles
- rise of service systems, competitions, regulations, infrastructure



USING LESSER

Adopt a Home

WHAT

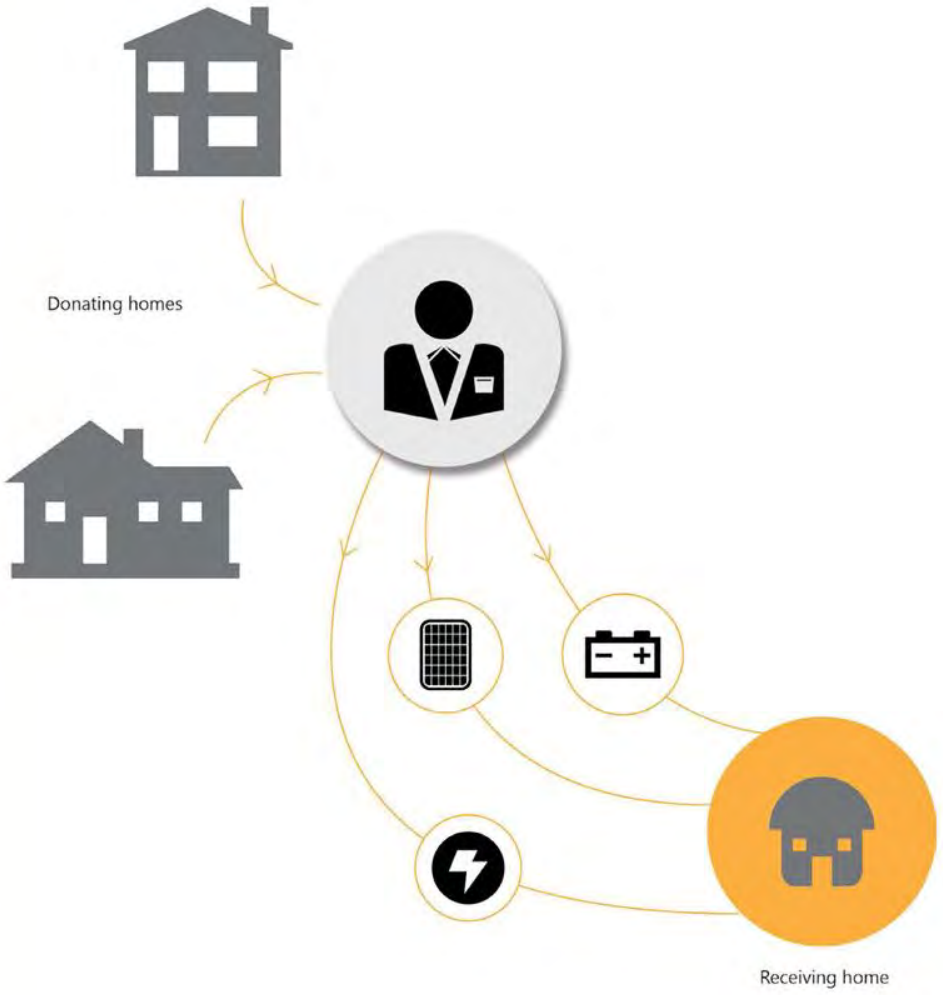
- deficit in energy consumption as compared to average is donated to house
- collection and donation of energy handled by a social organisation

WHY

- need for 'Giftivism' or a feel good
- driver for energy
- energy inclusion

IMPACT

- attempt at energy inclusion
- philanthropic drive
- might create role models out of donators
- new emerging services (transport/ storage/ maintenance, etc.)



Crowdfunding platforms

for low energy innovations

CO-CREATION

WHAT

- innovation workshops
- online camps
- get social innovators to team up with people
- involving businesses and educational institutions

WHY

- social innovation & entrepreneurship
- mutual interest of the community
- power in numbers: community connectedness

IMPACT

- Creative independency
- less reliance on established sources for financial sources
- community driven actions, hance they will be customized as per the community
- stakeholder involvement
- new emerging business models

Energy Credits
energy banking

CO-CREATION

WHAT

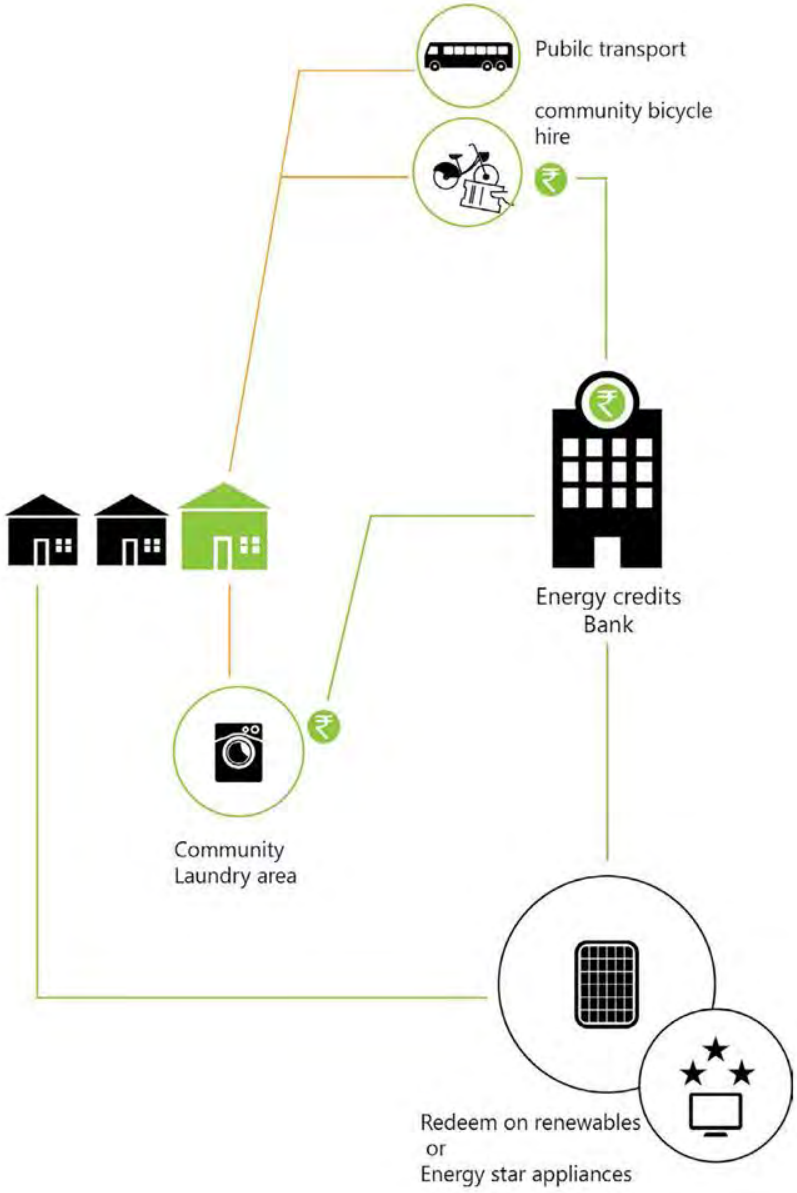
- energy credits from reduction in usage will be used for shared systems
- earnings through these services will be spent on smart energy choices

WHY

- to make energy an asset
- to make shared spaces accessible through energy credits

IMPACT

- community connectedness
- enhancing the value of energy
- smarter energy choices by the community
- new emerging services



Emulating Role Models

AWARENESS

WHAT

- creating platforms where role models can share low energy lifestyle habits
- encouraging other people of the community to inculcate habits of

WHY

- being inspired from people following low energy lifestyles
- giving them recognition, inspiration and

IMPACT

- causing a ripple effect
- increased awareness spreading across age groups
- creating community connectedness
- involving role models in community action and policy

Education Models

AWARENESS

WHAT

- co-create classrooms all over the world
- green energy habits of senior citizens can be shared with younger audience
- drives with school children
- toolkits to educate builders,

WHY

- children as potential audience have an impact to change
- ingraining right values at the right age

IMPACT

- causing a ripple effect
- increased awareness spreading across age groups
- infuencing choices of choice influencers

Gamification

AWARENESS

WHAT

- set of cards (cause and effect) for children
- interaction design
- augmented reality

WHY

- need to generate interest
- for an increase in curiosity and enthusiasm

IMPACT

- causing a ripple effect
- increased awareness spreading across age groups
- infuencing choices of choice influencers

Community Competitions

AWARENESS

WHAT

- innovation workshops
- online camps
- get social innovators to team up with people
- involving businesses and educational institutions

WHY

- social innovation & entrepreneurship
- mutual interest of the community
- power in numbers: community connectedness

IMPACT

- Creative independency
- less reliant on established sources for financial sources
- community driven actions, hance they will be customized as per the community
- stakeholder involvement
- new emerging business models

Sharing Personal Products

idling capacity

SHARING

WHAT

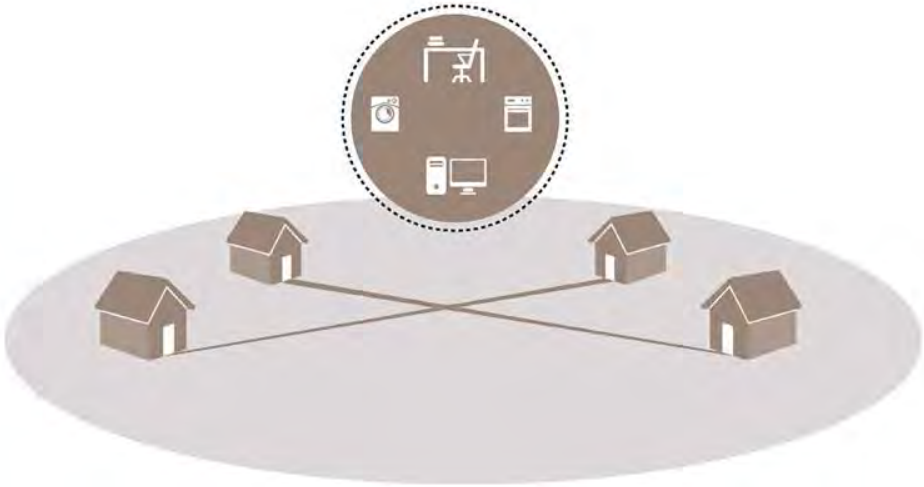
- at transport
- shared workspaces
- shared products and services
- renewable farms

WHY

- access to
- getting the most value out of products
- affecting choices

IMPACT

- community connectedness
- increase in green lifestyles
- decrease in the number of appliances
- new emerging services



Solution Testing

Gamifying Education
for school students

elementary and middle school students are at an impressionable age and thus, more open to forming new habits which last.

They carry a potential to spread their acquired knowledge about smart energy consumption starting with their own family, thus starting a ripple effect of change.

On each trump card is a way to consume energy efficiently or reduce wastage, which is rated on two parameters, eco-friendliness and amount of energy that can be saved.

The game work exactly like any usual trump card game, but aims at making using energy consciously

Education Models
For Appliances Salesmen

To educate salesmen in appliance shops about guiding the customers correctly into buying the right appliances for their homes

The set of cards designed for the salesmen have information regarding the energy usage of the appliances , like energy star ratings etc.

Basically it’s a tool for helping the customers to make a right choice, according to their “requirement”

Conclusion

1. Make people more conscious and contribute to the whole sustainable living individually and at the community level, by making everyone realize their individual responsibility towards sustainability.

2. All the energy produced(renewable/non-renewable) gets efficiently consumed, targeting for minimal waste.

3. Empathizing with the consumers of energy and deriving underlying insights from their thoughts and actions were the key drivers in coming up with solutions which were eventually found to be effective.

4. People and their behaviour, habits, choices and perspectives regarding energy consumption were decided to be the main point of focus in this project.

5. People and their decisions are what will largely influence the system towards a better future and hence these consumers of energy should be what the solutions concentrate on.

Thank You.

Priyam Vadaliya, Bhuvana Sekar
Anupreeta Agate, Mridula Dasari
Prof. Praveen Nahar

Project Blog :
https://energysystemsnid.wordpress.com/