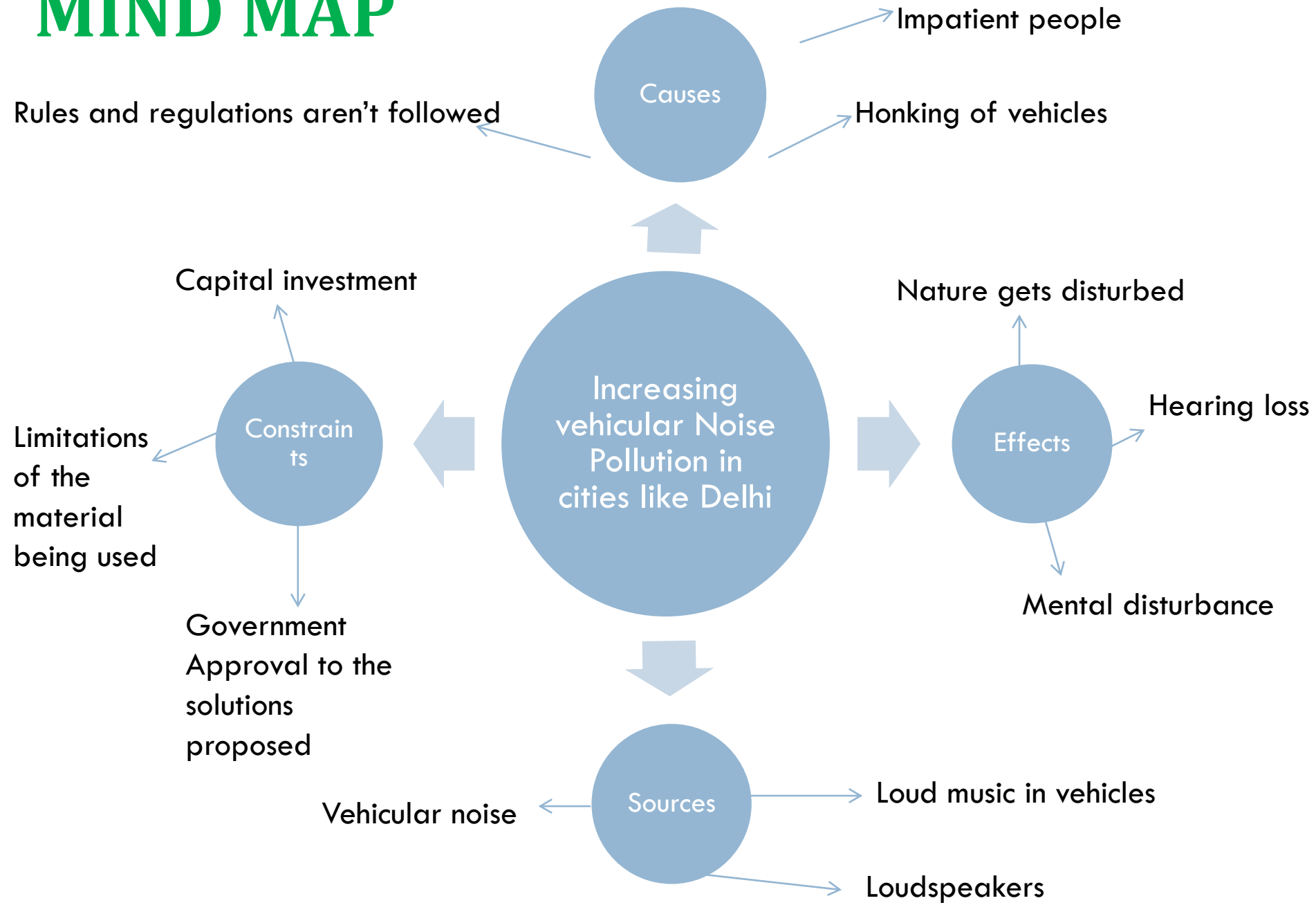
PROBLEM : NOISE POLLUTION AT TRAFFIC SIGNALS

Idea

Clean power from traffic noise.

MIND MAP


Causes
Impatient people
Honking of vehicles
Rules and regulations aren't followed
Increasing vehicular Noise Pollution in cities like Delhi
Constrain ts
Capital investment
Limitations of the material being used
Government Approval to the solutions proposed
Effects
Nature gets disturbed
Hearing loss
Mental disturbance
Sources
Loud music in vehicles
Loudspeakers
Vehicular noise

Design Thinking

- Empathize:
  - Vehicular noise pollution at the crossing and roads is quite disturbing.
  - Impatient people do not obey sign boards banning honking.
  - Nearby houses, complexes, and even nature gets disturbed.

- **Define:**
  - The problem of the unused energy of sound waves from honking of vehicles in traffic jams and congested crossings.

- **Ideate:**
  - Use a pressure absorbing material to absorb pressure of sound waves generated by several honks of vehicles near crossings.

Six Thinking Hats

White Hat

- Piezoelectric materials produce electric current when they are placed under mechanical stress (here stress by sound waves).

- These materials are available in variable shapes and sizes.

Black Hat

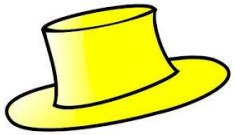
- Factors like rain, temperature, humidity can affect the piezoelectric materials.
- Electricity production done would be in very less amount and thus the overall feasibility.

Red Hat

- We will get a large amount of clean energy and that is something our country needs.
- Noise reduction would reduce the mental disturbance which is important for the upcoming generations.

Green Hat

- Having piezoelectric sensors even on the roads to improve the overall efficiency.



Yellow Hat

- Having piezoelectric sensors even on the roads to improve the overall efficiency of energy.
- Absorbs the noise from the vehicles and uses it in efficient way.
- Produces electricity.
- Doesn’t need voluntary support of people.

Blue Hat

- The installation of piezoelectric sensors in vicinity of the traffic jams uses the sound wave energy and produces electricity in turn.

Scamper Analysis

S

C

A → Adaption of this Clean Energy Model from its use in Roads.

M → Modification of types of Sources for Clean Energy.

P

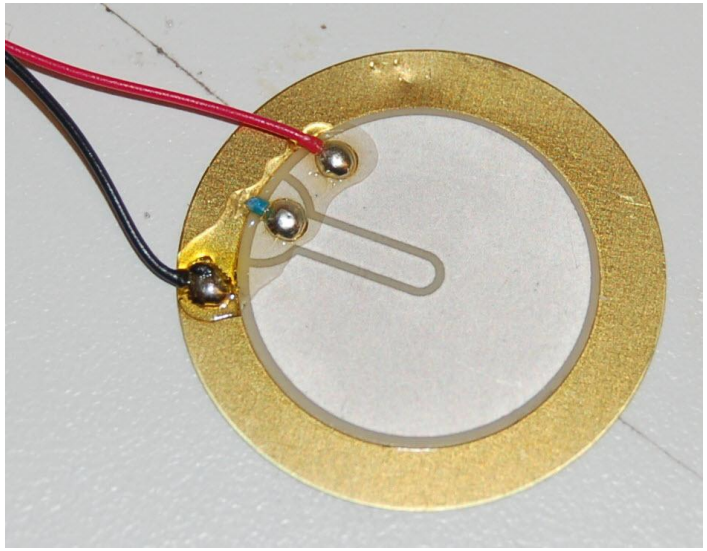
E

R

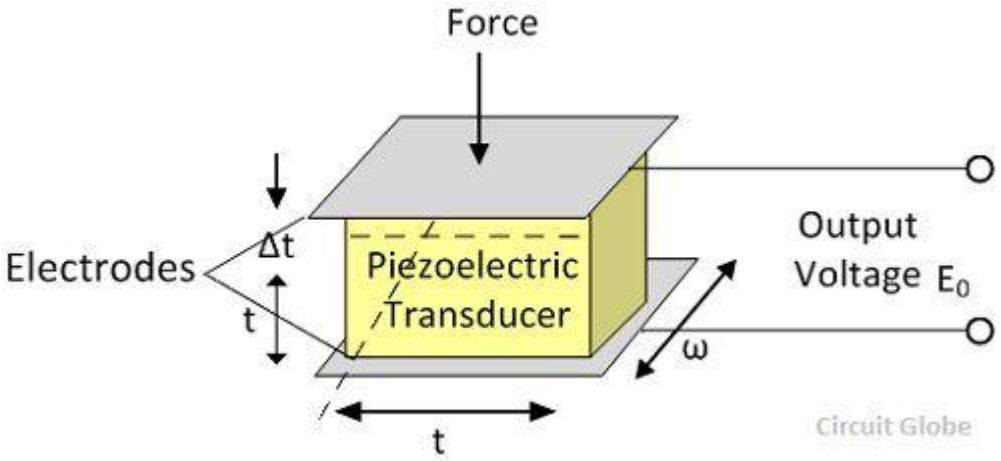
Prototype

- Piezoelectric sensors can be placed on the electric poles, road dividers and other pillars or hoardings near the traffic crossings.

- The sensors can be connected to each other and then to a main line to collect the electricity generated.



A small piezoelectric sensor



How a piezoelectric sensor generates electricity on application of stress

Test Financials

- Total Requirement – Rs. 82,000
- Rs. 500 per Pole + Rs.2,000 Battery
- 80 poles per Chowk.
- 2 Chowks.

Cost Benefit Analysis

- Fixed Cost –

Piezo Electric Coating – Rs.40,000 per Chowk

Battery– Rs. 1500-2000

Installation Costs – Rs. 3000

- Recurring Cost –

Maintenance Costs – Rs. 2000 / 3 months

Storage and Dispersal of Electricity – Rs. 15,000

Miscellaneous - Rs. 15,000

Cost Benefit Analysis

Production Capacity and Manufacturing Cost–

- Designed to give output : 5V-1A
- Units of Electricity can be generated per month with this Setup at one Chowk.
- Therefore, the cost for manufacturer comes to Rs.x/Unit.
- Thus, it can be sold for x/Unit and thus the Anticipated time for Break Even is x years.

Supply Chain Management Analysis

- Market Validation and Target Market :

- Industries
- Households
- Electricity Selling Companies
- Government
- Large Corporate Offices

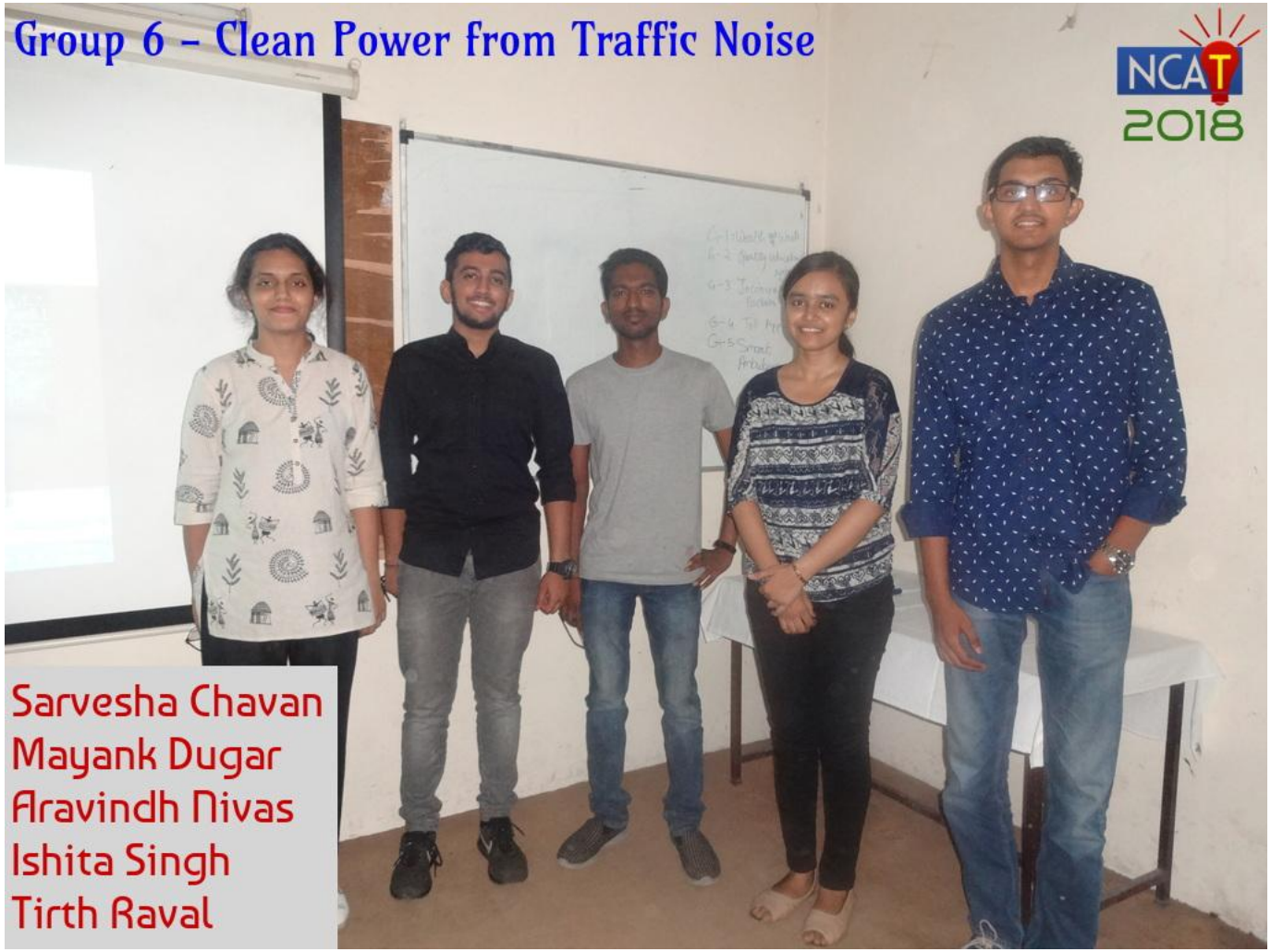
Marketing Strategy

- MoU with Government.
- Awareness about Clean Sources of Energy.
- Digital Marketing Campaigns highlighting the Clean Source if our Electricity.
- Contracts with Electricity Selling Companies.

Future Plans

- To expand at various Chowks In Delhi – 6 to 8 months and then establish this in major Cities in India – 3 to 4 Years.
- To use this effective clean energy source at other places where there is high noise pollution like industries, printing press etc.
- To also cater to other Pollution problems.

Arigatou Gozaimasu !



So from now on, the more you horn, more energy is born.