Telecom(Mobile)

- **Mobility**
  - Generation
    - 2G
    - 3G
    - 4G
  - Coverage
    - 2G - 3.7 Kms
    - 3G - 2.6 Kms
    - 4G – 0.7 to 0.42 Kms
  - Sites
    - Ground Based Towers
    - Roof Top Tower
    - Ground Based Mast
    - Roof Top Mast/Pole
    - In Building Solutions
- **Fixed Line**
  - Wi-Fi, Lease line, Broad band etc…..

465000+ Sites
INR 8800 Crs
2.2 Billion Lts Diesel
5.3 Mn Tn Carbon emit
****More sites for coverage, capacity*

Need….. Reality…… Effects….. Solutions

24*365 Uninterrupted Power

- Unstable Grid
- Poor Availability
- High DG Run Hours
- High Maintenance
- Manpower need
- Power , Diesel pilferage

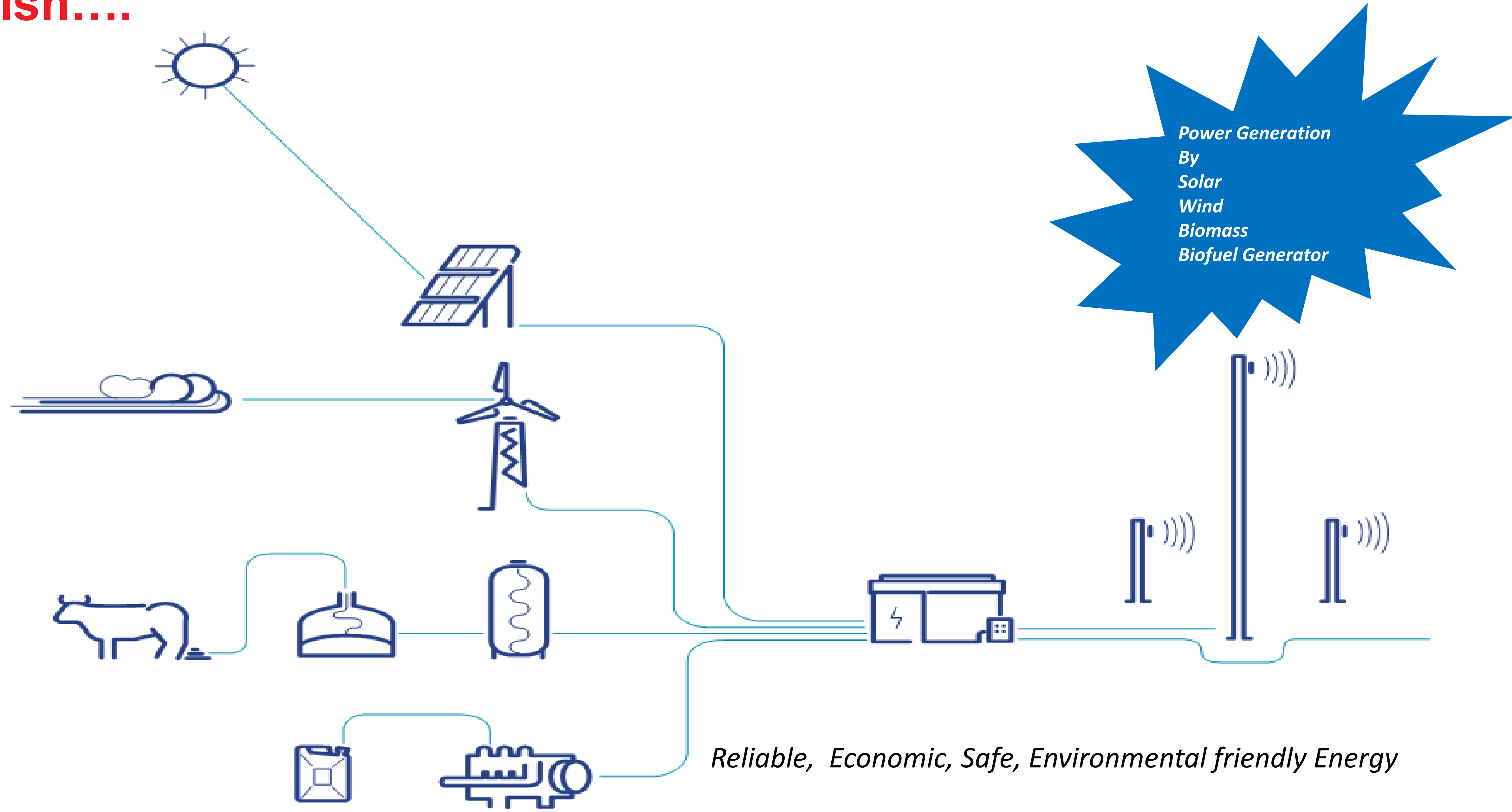
- High Capex
- High Opex
- Environmental impact

TARI
75% Rural, 33% Urban Telecom sites on Renewable by 2020
20GW Power offset

- Renewable Energy

-25% +

Wish….



Reliable, Economic, Safe, Environmental friendly Energy

Challenges

- **Wind**
  - Structural
    - Space on Top of Tower
    - Load Bearing Capacity of Towers
    - Capability of Existing Tower for hosting
    - Vibration due to wind cutting
  - Noise
    - Electrical Noise in A/C
    - Audible Noise
  - Generation
    - Voltage Band
    - Un predictable Capacity Generation
  - Safety and Maintenance
    - Regular Maintenance due to dynamic load
    - Breaking at High wind speed
    - Falling objects in habited area
- **Solar**

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Challenges

- **Solar**
  - Space
    - Space for Solar Panel
    - Shading due to Vegetation, Buildings
    - Land usage conversion
    - Power Storage for off grid sites
  - Technology
    - Efficiency of Panels
    - Flooded battery Charging Higher Voltage
    - Temperature for Batteries
  - Security
    - Site wise security for Theft prevention
    - Sabotage, Damage by stoning
  - Maintenance
    - Regular and distributed Maintenance due to dust
    - Individual Storage and maintenance
- **Wind**

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Challenges

Solar

Wind

Common

- High Capex
- High Opex**(Security and Maintenance Manpower for daily activity)
- Longer ROI
- Higher Maintenance
- Space Constrain

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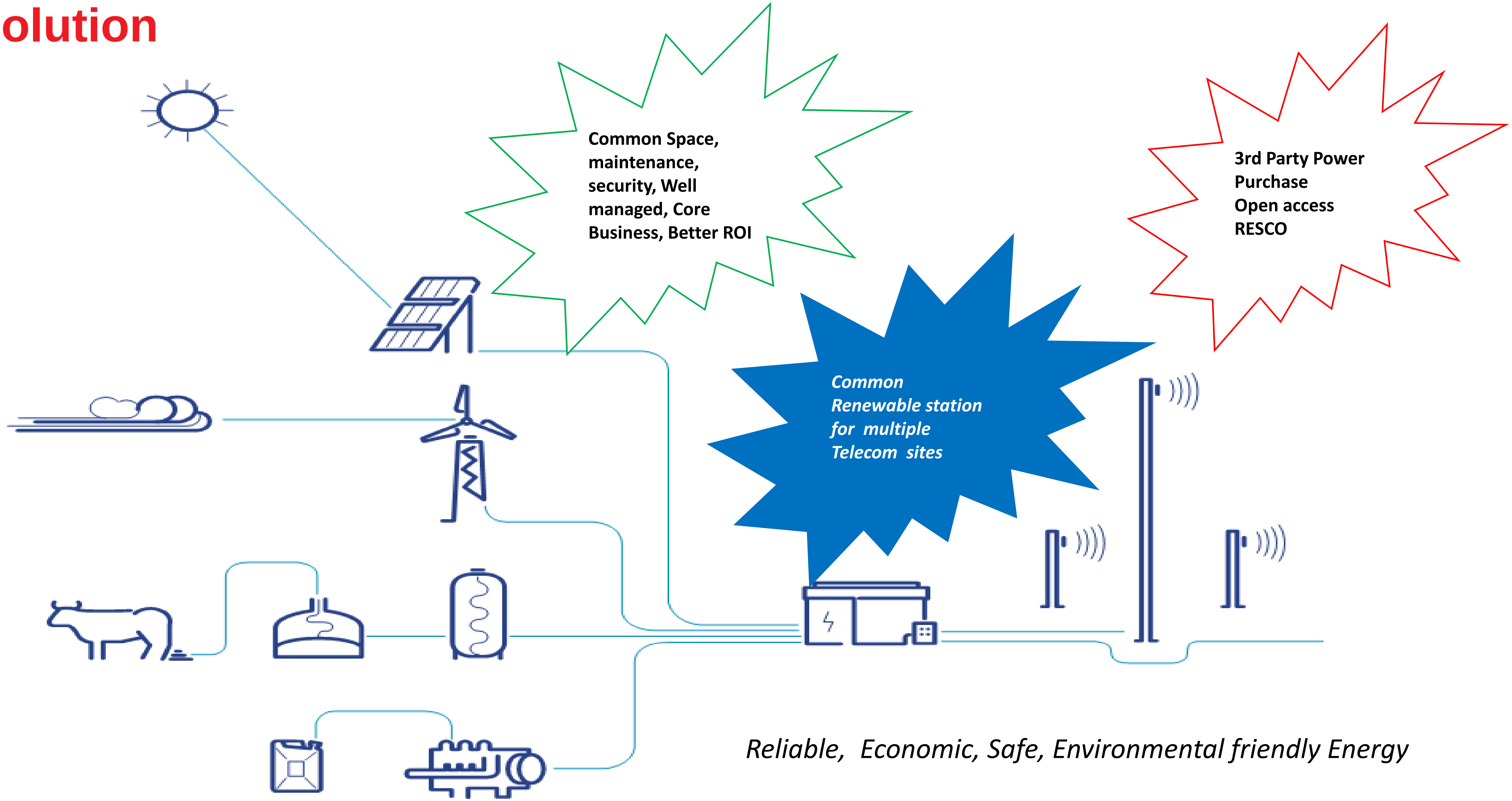
Solution


Common Space, maintenance, security, Well managed, Core Business, Better ROI
3rd Party Power Purchase
Open access
RESCO
Common Renewable station for multiple Telecom sites
Reliable, Economic, Safe, Environmental friendly Energy

Combined Team work

More RESCO
Better Battery
Design Support

LT Power Purchase
Facility
Funding, Subsidy

PARTNERS

- **Miniature , Economic Designs, Technology**

  Implement Solar in the site

  Wind turbine in existing Towers, Sites

  Faster ROI
- **Rugged design**

  Lower Opex

  Less Maintenance

  Better prevention for Damage
- **Battery**

  Small foot Print, Faster Charging, Non Temperature Dependent, Low maintenance Storage (Battery…etc)
- **RESCOs**

  More/ Distributed RESCOs on Opex Model

MNRE

- **LT Power Purchase Facilitation**

  Third party Power Purchase

  Open access facilitation
- **LT Power Banking capability**
- **Street Furniture's usage for Renewable solutions Implementation**
- **LT Renewable Power Distribution permission**

  Own Centralized source to Telecom sites

  RESCO source to telecom sites
- **Higher Funding and Subsidy**