

Need for resource efficient walling material

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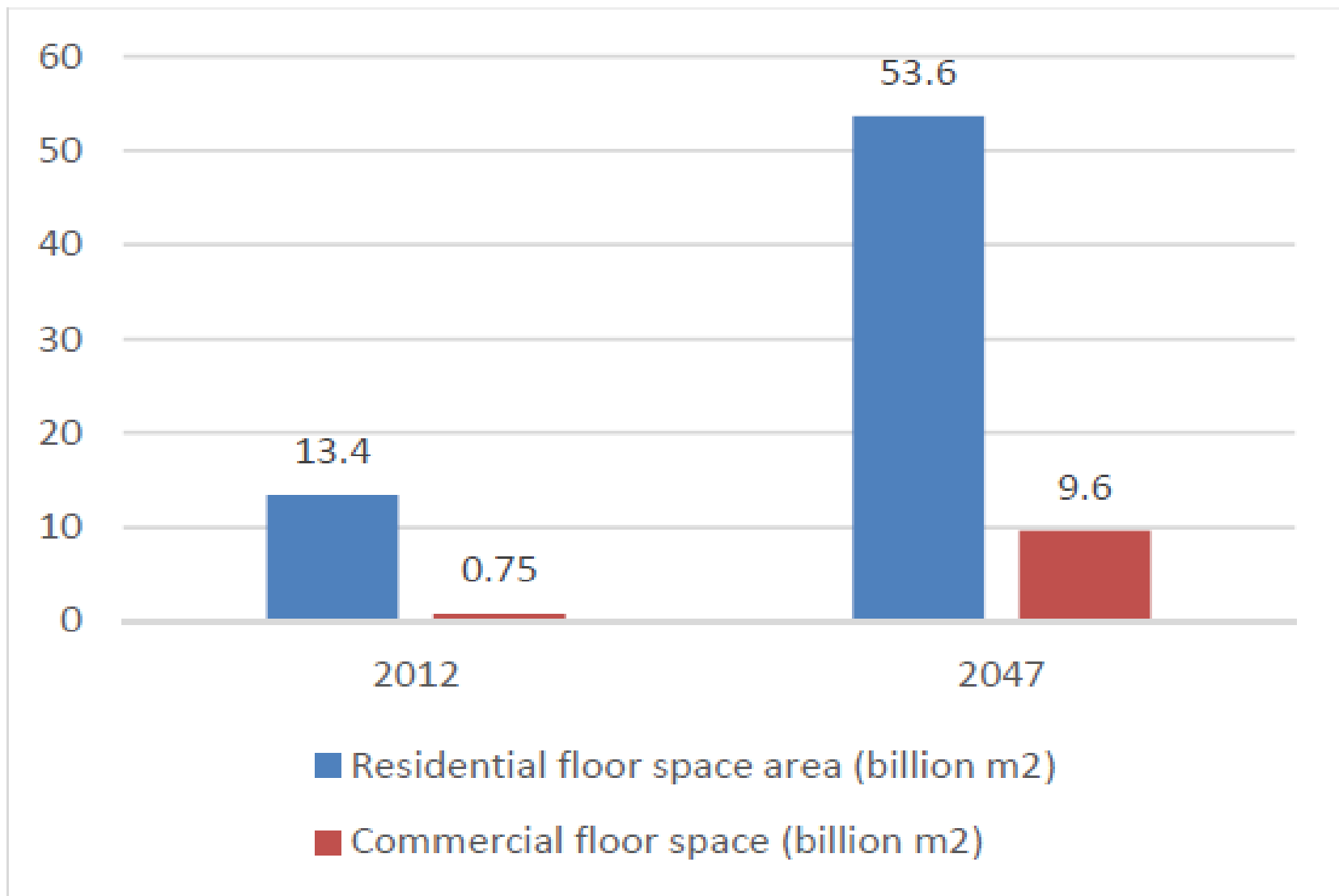


Walling material sector in India

- It is said, India is far lagging behind in infrastructure development and around 70 % of India is still to be constructed;
- The “**Housing for All**” scheme of Indian government will require roughly 11 crore (35000 houses per day) new homes by 2022;
- 2 trillion USD
- An estimate shows that the building floor space will quadruple from 14 to 64 billion sq. meter by 2047.

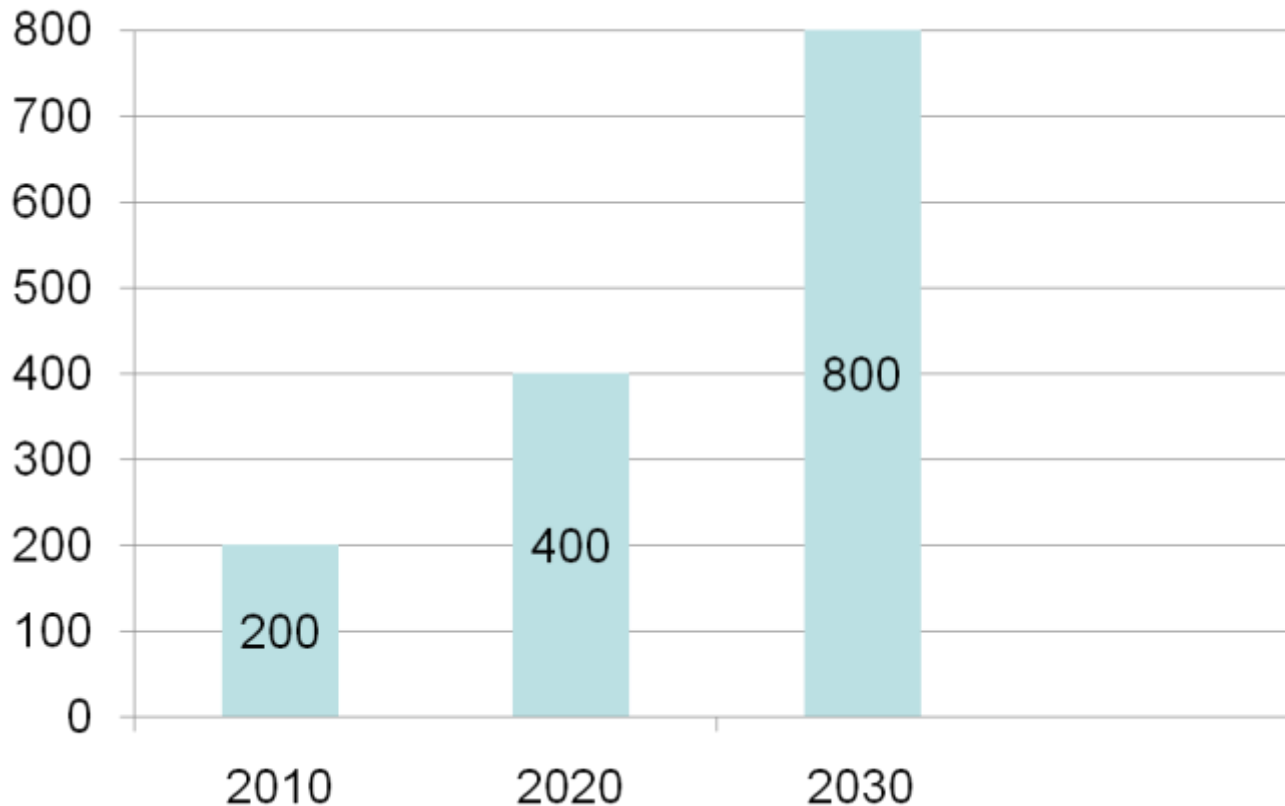


Growth in Building Construction





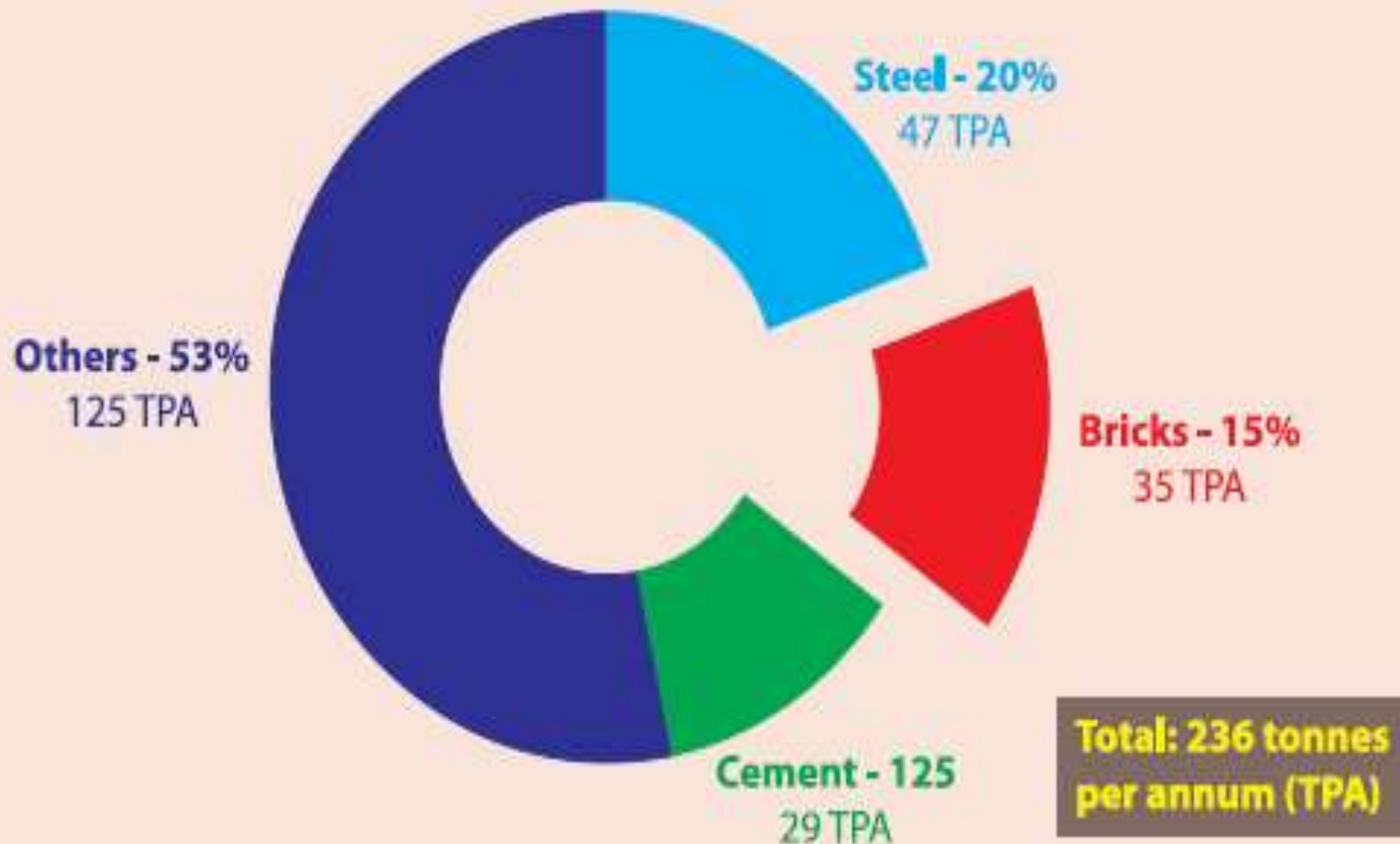
Brick demand



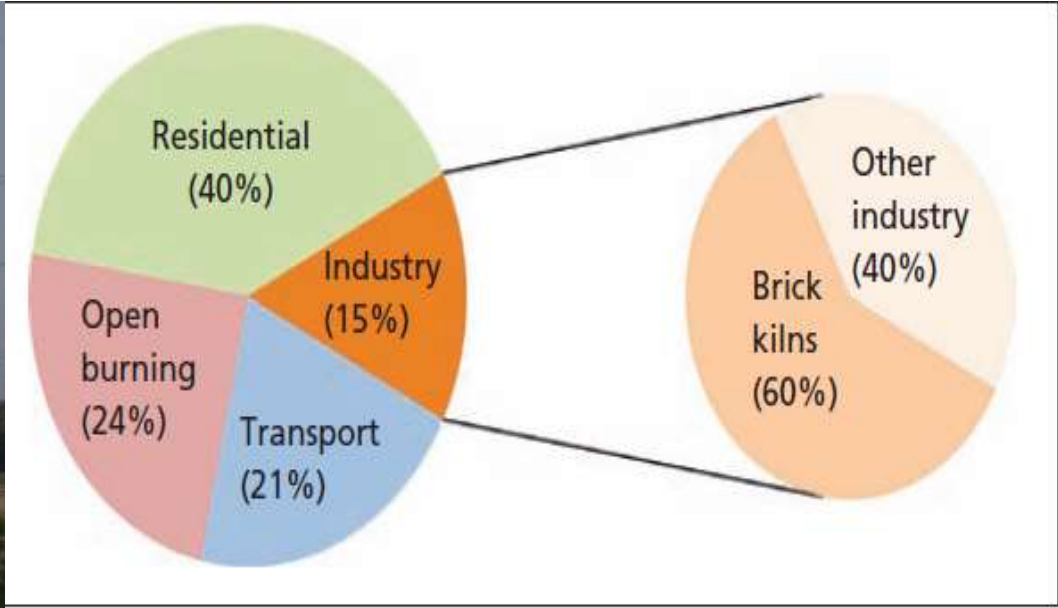
* Market of brick industry – 200 billion bricks @ Rs. 4 = 800 billion Indian rupees



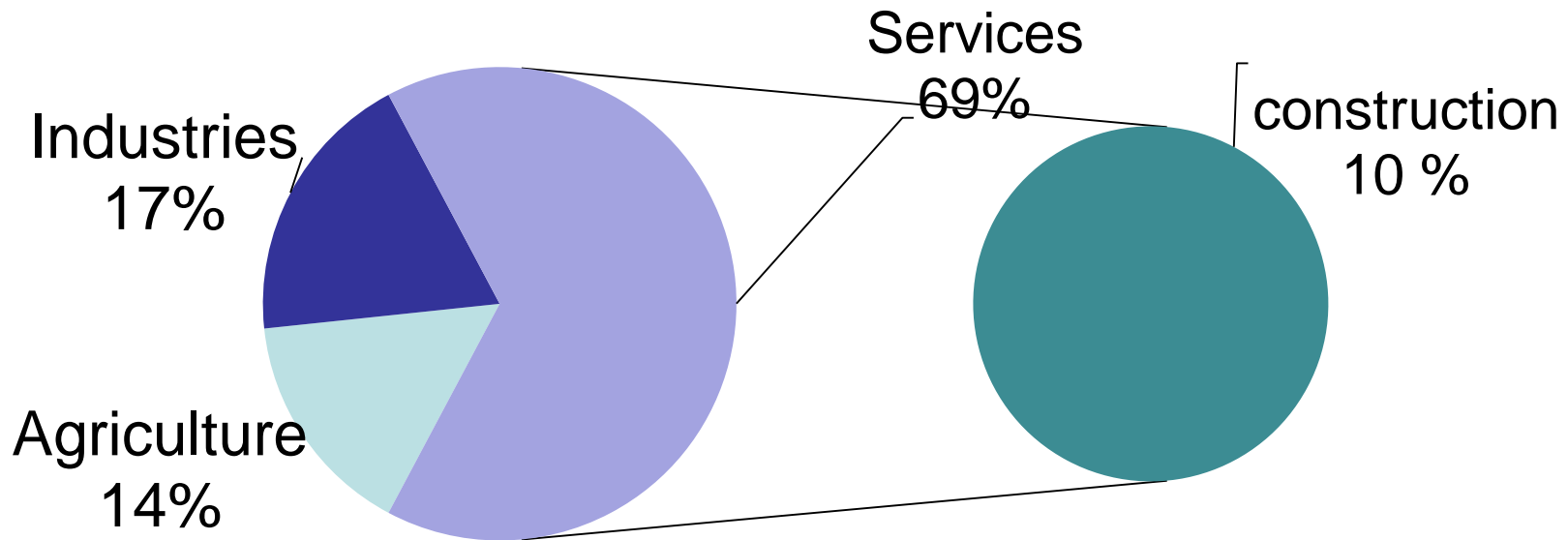
2nd largest industrial consumer of coal



Environmental impacts



Contribution in Indian GDP



*Thus it becomes important to closely monitor and transform the growth of the sector in right direction – **need for resource efficient walling materials***

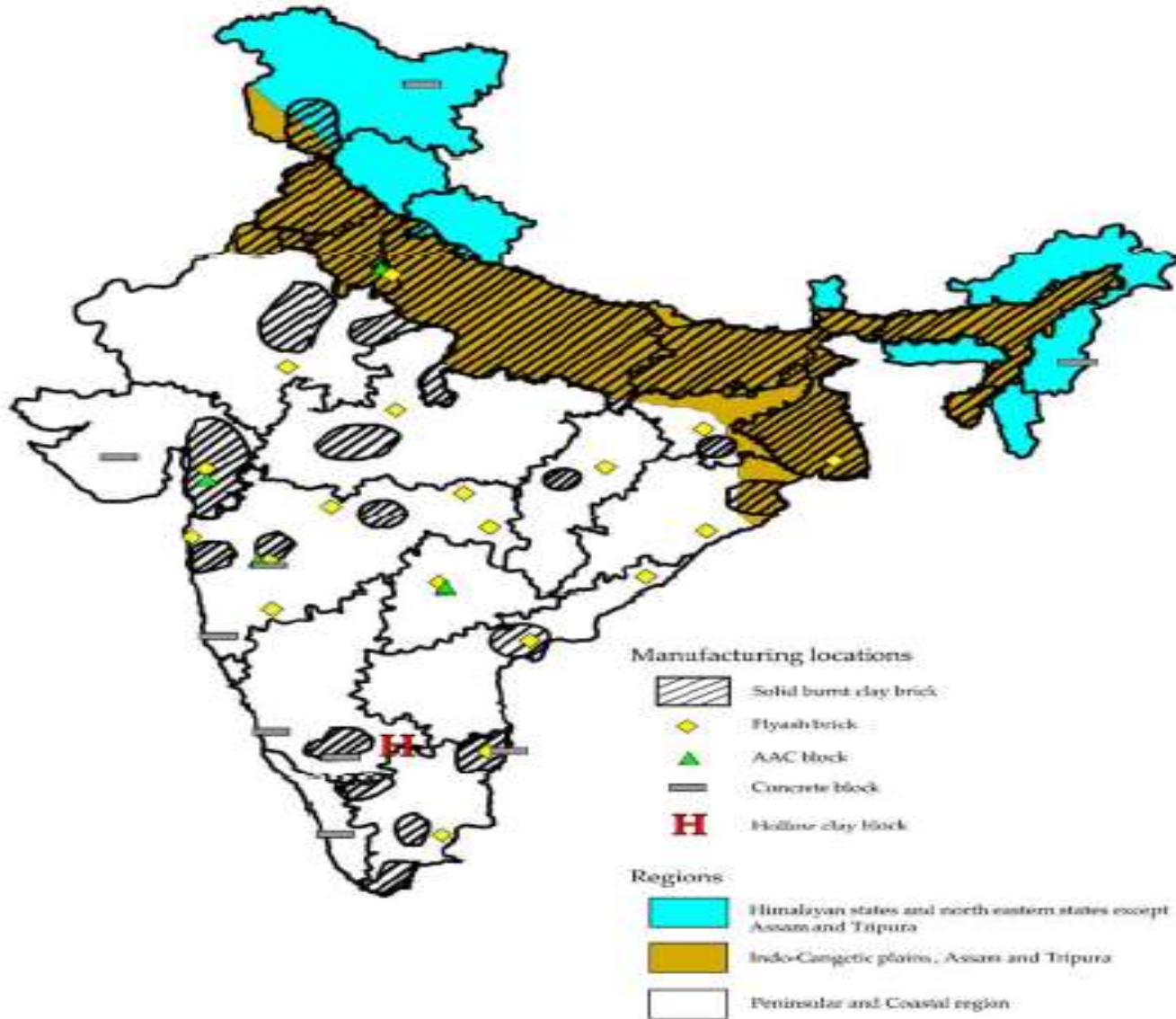


Market of bricks

Type of brick	Annual consumption (2014/15)
Solid burnt clay bricks	243 billion bricks/year
Hollow and perforated burnt clay bricks	0.2 billion bricks/year
Pulverised fuel-ash lime/cement bricks	11.7 billion bricks/year
Autoclaved aerated concrete blocks	4.4 billion bricks/year
Concrete blocks	15 billion bricks/year
Total	274 billion bricks/year



Geographical distribution of the brick manufacturing industry in India



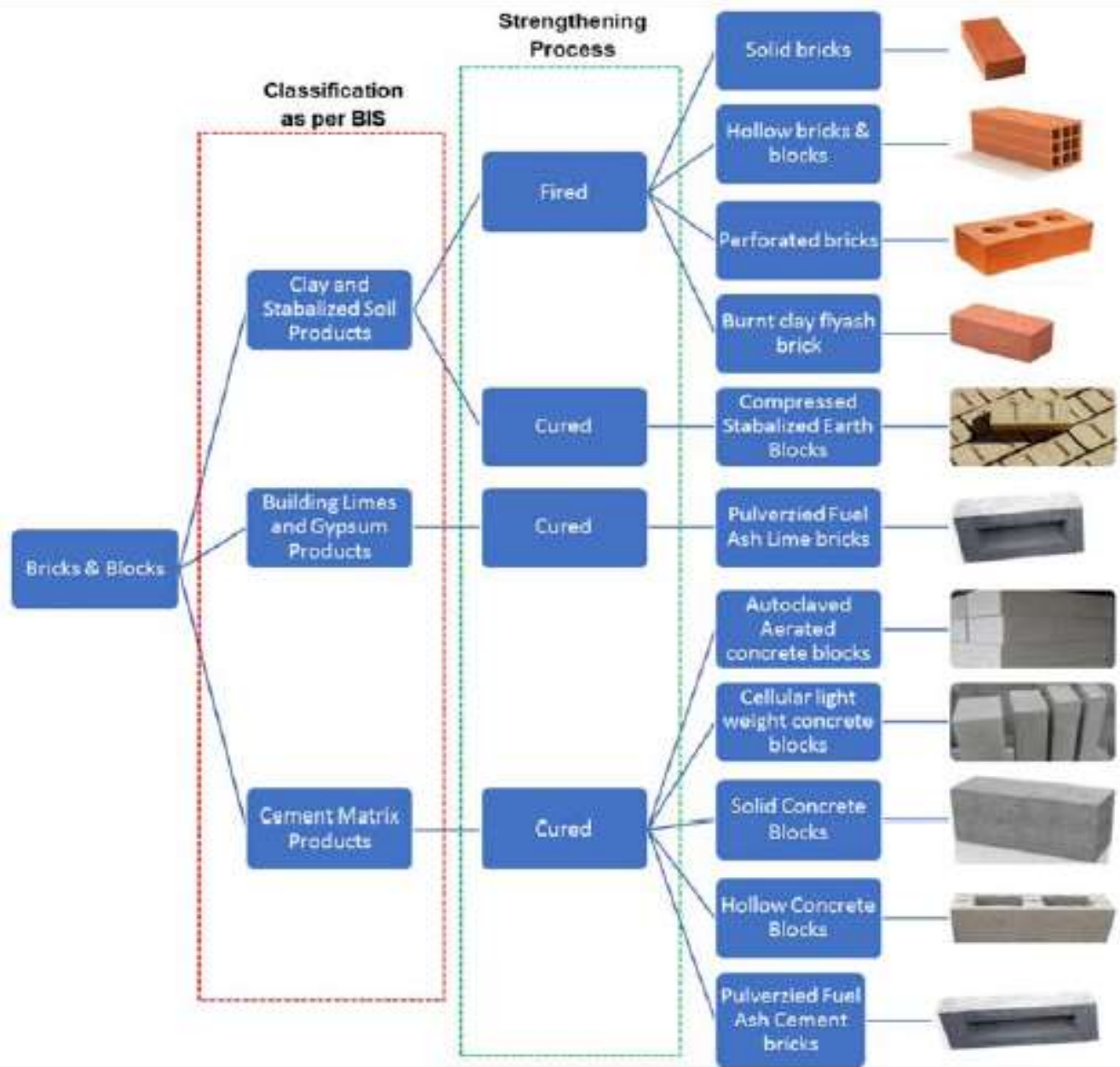


Clay brick to resource efficient brick








- Clay and stabilised soil products
- Building lime and gypsum products
- Cement matrix products
 - AAC/CLC



Various masonry product based on BIS classification



Comparative Assessment Of Different Walling Materials

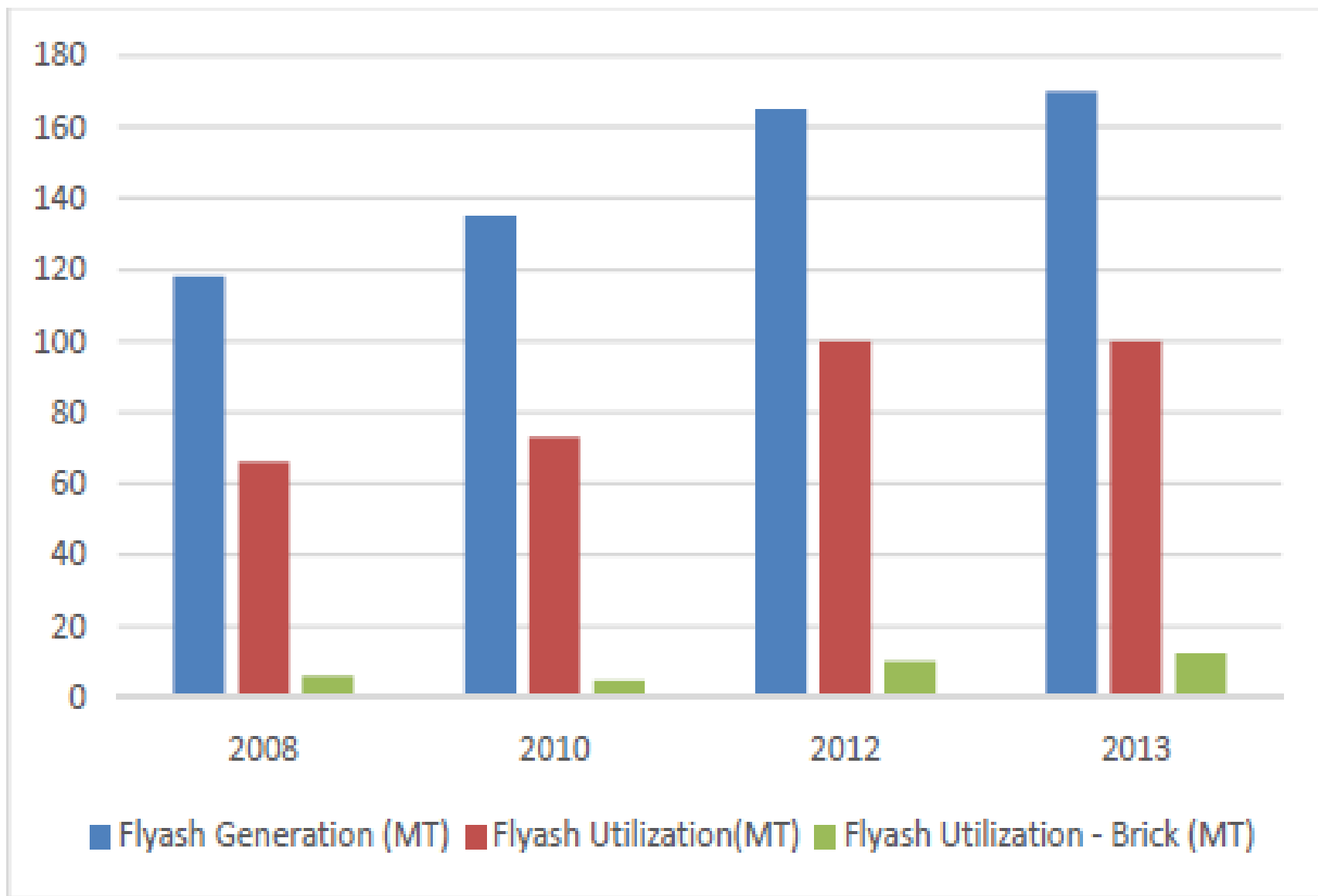
		Mined raw material (kg/m ³)	Primary Energy for Manufacturing (MJ/m ³)	CO ₂ emission for manufacturing (T CO ₂ /m ³)	Thermal Conductivity (W/m-K)
	Solid fired clay bricks (FCBTK)				
	Hollow fired-clay blocks	<p>Comparative Assessment</p> <ul style="list-style-type: none"> -Fal-G, AAC blocks, hollow clay fired blocks and compressed stabilized earth block better than others – can be called resource efficient -Monolithic concrete wall – worst on resource efficiency parameters amongst the options considered -Solid fired clay brick and concrete block needs improvements to make them resource efficient 			
	AAC Block				
	Cement Concrete Block				
	FaL-G Brick				
	Monolithic Concrete Wall				
	Compressed stabilized clay Block				



FLYASH BRICKS

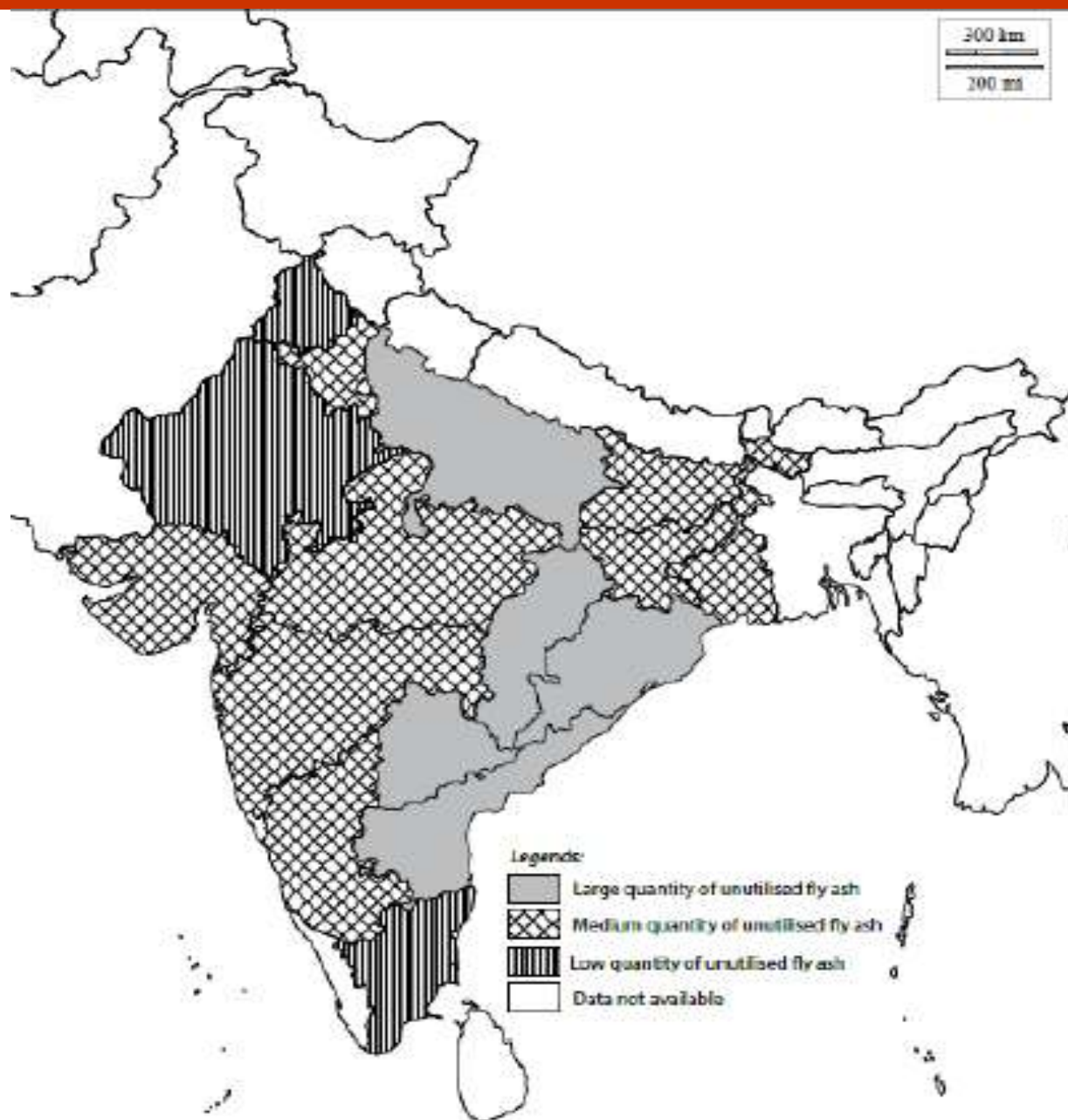


Flyash generation and utilization





Flyash availability in the country





Road Blocks to achieve

- **No policy for demand side push for ash utilisation in bricks, road construction etc.**
- **Logistics cost** - Ash transport costs
- **Limited demand**- in remote locations with several power plants
- **Quality issues of ash bricks** - perception on strength, color etc.
- **Lack of level playing field:** Clay and fly ash brick
- **BIS standard does not mandate use**- minimum level of fly ash that can be used in construction material not defined.



CSE's Recommendations

TO INCREASE DEMAND

- **Mandate usage of fly ash bricks in Top 53 urban centres** (population > 1 million) by amending byelaws. Policy must be made consistent among various government departments. This can lead upto 80 mt fly ash usage annually
- To establish **Fly ash mission** to promote use of fly ash – raising finances, setting up plants, securing raw materials sourcing, selling finished products alleviating quality concerns etc.
- **Level playing field:** Red clay brick sector dominates 80 % of the brick market in India. (enjoy tax breaks etc.) To compete, fly ash brick makers must be provided tax relaxations, simplified procedures for establishment and operations
- **Public disclosure of data:** User agencies like the road construction bodies, etc. should publish detailed data on fly ash usage.
- **Skill building-** of brick manufacturers and road construction agencies



China: Banned Clay bricks in urban agglomerations

- The production and use of solid clay bricks in all municipalities, large and mid-sized cities in coastal areas were banned beginning in 2000
- As a result, the production of solid clay bricks reduced from around 620 billion in 1995 to around 400 billion bricks in 2010 (production of other types of bricks increased from 100 billion in 1995 to 400 billion in 2010).
- Shanghai: first Chinese city to attempt fly ash utilisation. Shortage of construction materials drove the choice of fly ash. Since 1997 the city has been using fly ash to construct foundation slab for tall buildings.



Why capacity building programme?

- **Environmental management**
- **Process for ensuring quality of bricks**
- **Mechanization**
- **Operation and maintenance**



Thank you