



INTEGRATED SUGAR INDUSTRY IN INDIA

AMIT BHARDWAJ

INDIAN SUGAR MILLS ASSOCIATION, NEW DELHI, INDIA

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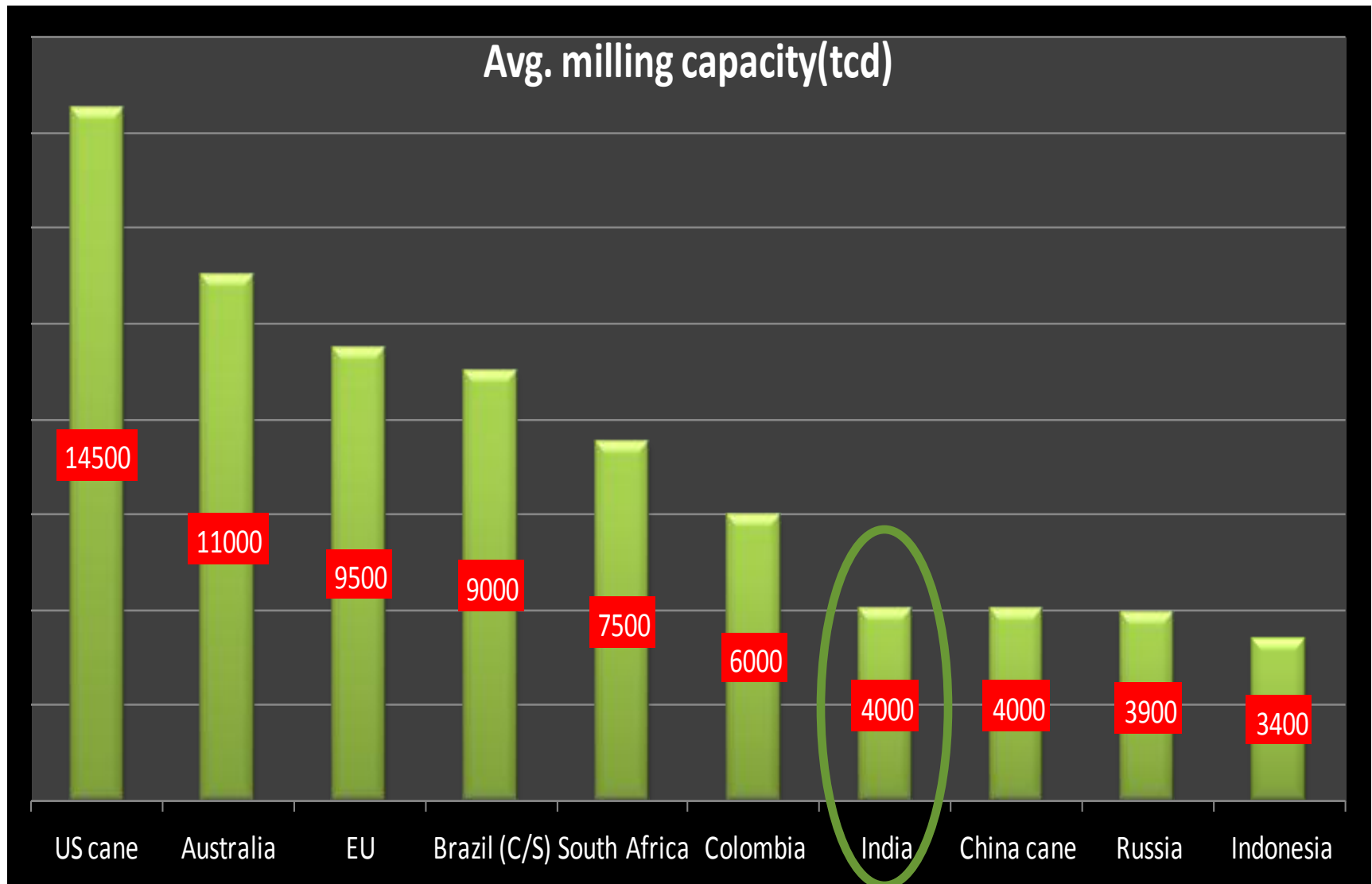
Flow of Presentation.....

- Overview of Sugar Industry in India
- Sugar & its By-Products
 - Molasses/ Alcohol/ Fuel Ethanol
 - Bagasse/ Cogen
 - Press Mud/ Bio-fertilizer
- Assistance through Policy Intervention
- Way Forward

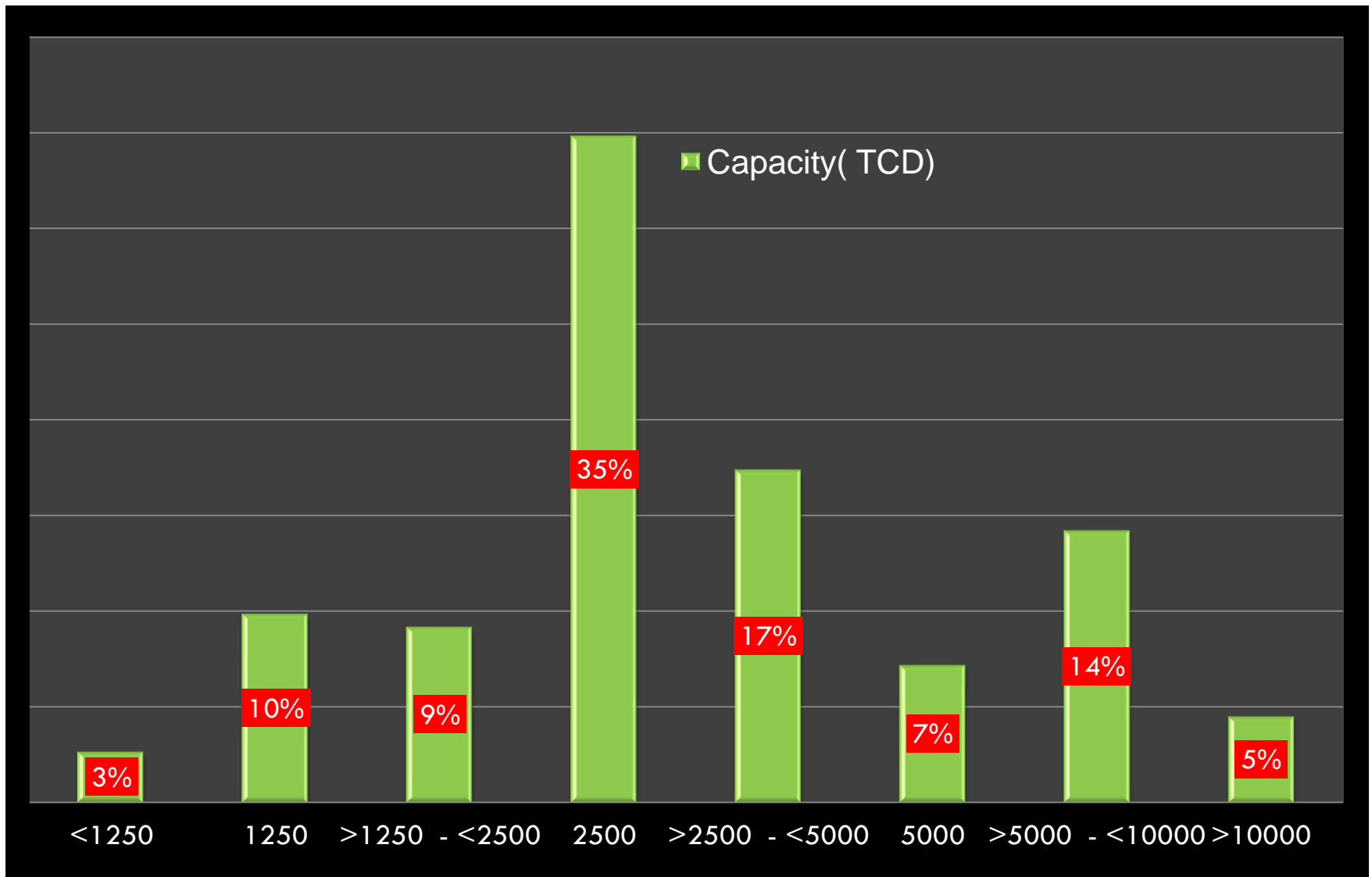
Snapshot of Indian sugar industry

- Operational sugar mills – 526 operational (695 installed)
- Total sugarcane crushing capacity – 2.3 mln tcd
- Total sugar production capacity – over 30 mln tons per annum
- Average crushing capacity - 4000 tons per day per unit
- Out of total operational 526 units:-
 - Integrated units - 30%
- Mix of Private/Public/Cooperative:-
 - Private & Public –309 units(Cane crushing Capacity – 19.1 mln tons/annum)
 - Cooperative – 217 units (Cane crushing Capacity – 12.7 mln tons/annum)

Average Milling capacity at different countries...



Capacity profile of Indian sugar industry



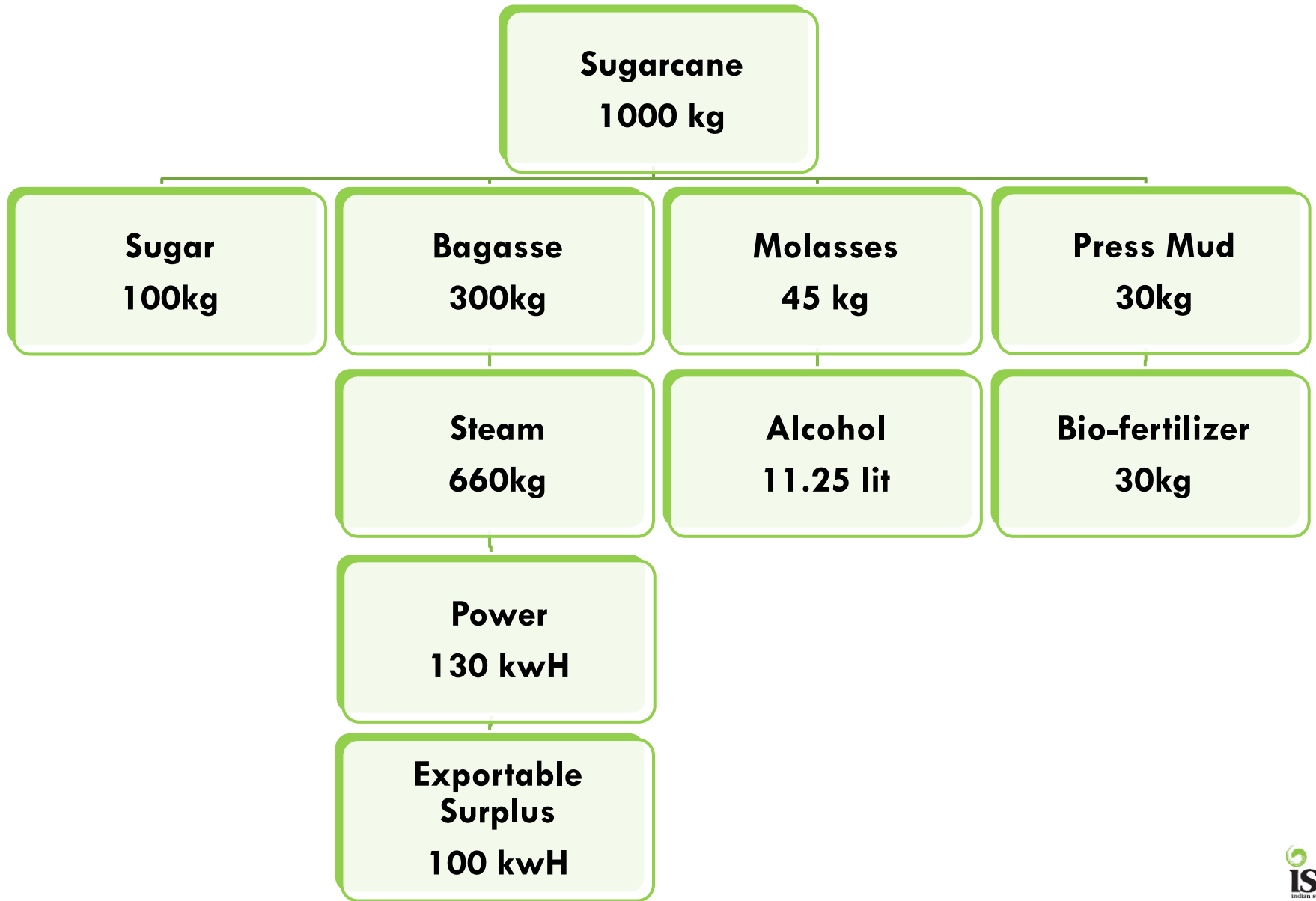
Integrated sugar mills

- Integrated sugar mills having Cogen & Distillery - 160 units

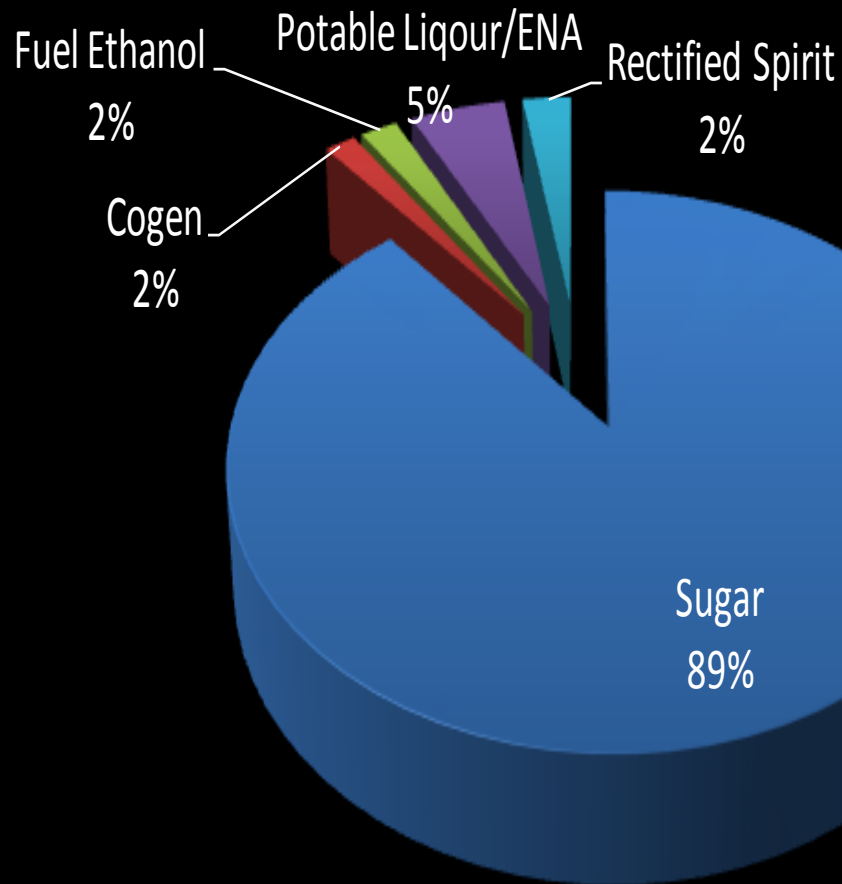
India	Distilleries (attached with sugar mills)		Cogeneration	
	No. of units	Capacity mln lit per annum	No. of units	Exportable Energy (MW)
Total	160 (147 units make fuel ethanol)	2281 (capacity of 147 units is 2 billion lit/yr)	210	3200

Note :- In addition to above, another 168 standalone distilleries in India

Sugarcane Value Chain



Revenue generation of a typical integrated mill



Sugar Industry turnover \$ 13 billion

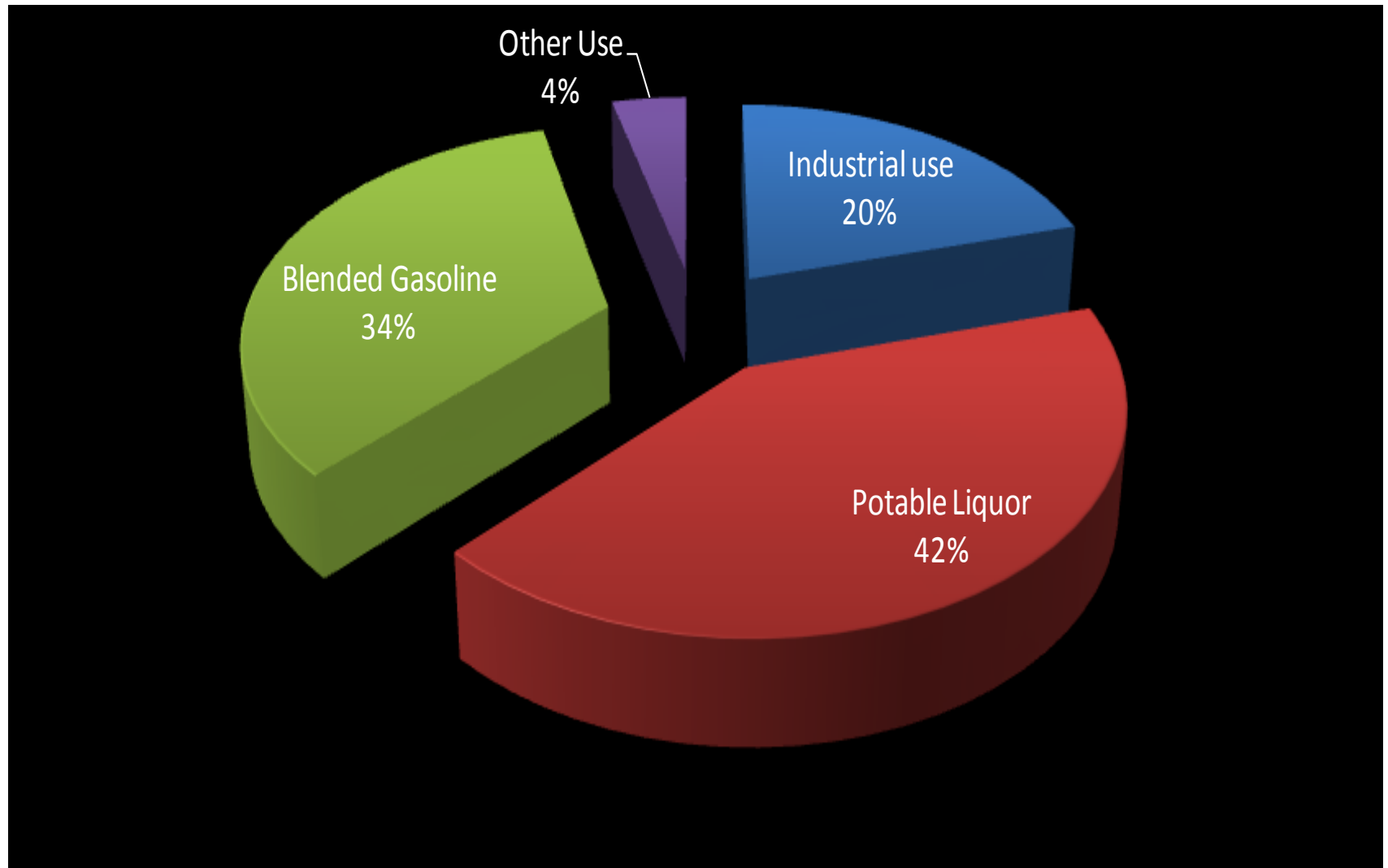
Consideration of by-products in cane pricing

- Government of India's Fair & Remunerative Price
 - Considers realisation from by-products while fixing the FRP
- Rangarajan Committee on linking cane & sugar price
 - Cane price be determined at either 70% of revenue realised from sugar and first stage by-products or
 - 75% of revenue realised from sugar only (5% weightage to by-products)

Distillation capacity in India

- Total about 328 distilleries having installed capacity of 6 billion litres of alcohol production
 - Out of it, 2 billion litres of fuel ethanol capacity
 - 1.8 billion litres with sugar mills
 - 0.2 billion litres with stand alone distilleries
- A total of 160 sugar mills have 2.3 billion litres distillation capacities

Sectoral demand of alcohol in India



Ethanol blending programme

- **Oct 2007:**
 - CCEA decision for mandatory 5% blending,
 - With fixed procurement price of INR 21.50 per litre
- **Nov 2009:**
 - Mandatory 5% blending reiterated by CCEA and
 - Procurement price re-fixed at INR 27 per litre
- **2009 National Bio-fuel Policy:**
 - 20% ethanol blending by 2017
- **Aug, 2010:**
 - Mandatory 5% blending again reiterated by CCEA
 - INR 27 per litre fixed as provisional price ex-factory
 - Expert Committee formed for final ethanol pricing policy
- **Nov, 2013:**
 - Mandatory 5% blending reiterated
 - OMCs floated requirement for 2 seasons

Ethanol: tool to balance sugar production

- 5% blending programme requires 1 billion litres of ethanol
- All ethanol currently produced only from molasses
- Approval and standards fixed in 2009 for 10% blending
- Increase from 5% to 10% will require another 1 billion litres
- Can divert cane juice or B-heavy molasses into ethanol
 - Cane reduce 1.7 million tons of sugar production
- Flexible blending programme can control sugar surplus

Several uses of Bagasse

- Burn in boilers to generate power
- Sell to paper manufacturers
- Use to make press board
- Research on use of bagasse to make ethanol
- But, in India, largest use is for generation of power

Bagasse based cogeneration of power

- At current installed crushing capacity, potential to generate power is said to be 7500 MW
- Only 210 mills generating exportable power
- Currently, 3200 MW of power is exported by sugar mills to the grid
- Rates offered by State Government agencies in the range of
 - INR 3.12 - INR 6 per unit
- Some units are trading power at INR 4.5 per unit too

The technology

- High pressure boilers of 105 ata being used for last 5 years
- Higher pressure boilers of 130 ata under commissioning in few mills
- Use back pressure and condensing type turbo-generators
- A few multi fuel boilers to allow use of coal, grain husks etc. also getting installed in last few years, for sale of power in off-season
- Concept of better utilisation of idle capacity in off-season too

Press Mud

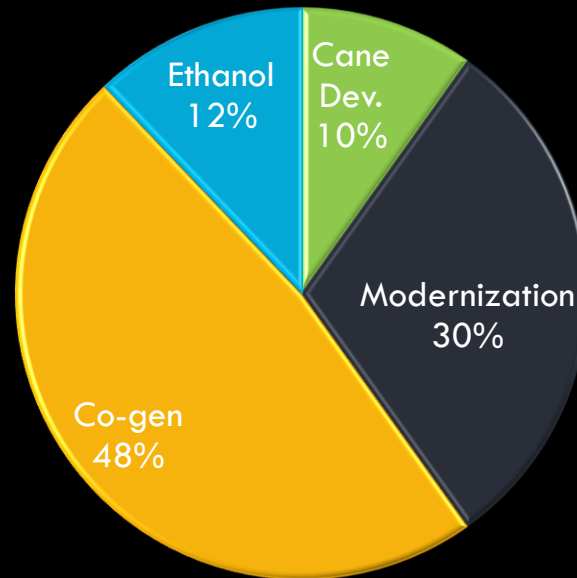
- India produces about 7.5 mln tons of Press mud every year
- Press mud is used as bio-fertilizer and gives best results in phosphorus deficit soils
- Press mud improves biotic conditions, organic content, water holding capacity and reduces salinity
- Avg. realization from press mud is about INR 150-200 per ton

Government support for by-products

- Government of India provides concessional loans
 - From Sugar Development Fund (SDF)
 - To meet shortfall in promoter's contribution
 - For both cogen and ethanol projects
- Capital subsidies are also provided
 - For cogen projects

SDF funds for various schemes in India

% of SDF loans of about USD 1 billion in last one decade under different schemes



- Every Year sugar mills contribute about INR 6 billion through cess in SDF (Sugar Development Fund)

Way forward

- Integrated units give better realization and tool to balance the sugar surplus to the sugar mills
- Huge untapped potential
 - 7500 MW of power and unlimited potential for ethanol
- Almost all new mills in India coming up in integrated form
- Government support should help improve
 - Finance availability and rationalisation of tariff rates
- Challenges to smaller units with 2500 tcd or lower, mostly in the cooperative sector

Thank you

amit.bhardwaj@indiansugar.com