

**Development of  
Natural Gas Industry  
in  
India  
Issues & Way Forward**

**By**

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# **International Scene and its impact on Natural Gas**

- **Deep Recession in the West.**
- **Enhanced Global Availability.**
- **Yet to be discovered Gas reserves**
- **Reserves higher than Oil**
- **Shale Gas redrawing Global Energy Map.**
- **US aims to meet 30 to 40% of its requirements from Shale Gas**
- **Transition of LNG from Sellers Market to Buyers Market**
- **Increase in liquefaction capacity**
- **Increase in Size & No. of Tankers**
- **Projected Demand to grow 1.6 % per annum**
- **Increase in share in Energy Basket**
- **Three regions to dominate supplies- ME, Africa and Australia**
- **Natural Gas % share in Asia Pacific – 11%**
- **LNG % share in Asia Pacific – 70%**

# INDIAN ENERGY SECTOR : AN OVERVIEW

	World	Asia Pacific	India
Energy Consumption (MTOE)	11294.9	3981	433 5 <sup>th</sup> Largest Energy Consumer
<b>Energy Mix (%)</b>			
Coal	29%	51%	53%
Oil	35%	29%	31%
Natural gas	24%	11%	8.6%
Nuclear	5.5%	3%	0.80%
Hydro	6.4%	5.3%	6%
Oil & Gas Imports (MTOE)	3245	1097	129 (US\$ 76 billion)
<b>Growth in Energy (10 yrs)</b>			
Total Primary Energy	2.1%	4.1%	4.8%
Natural Gas	2.5%	6.5%	6.6%

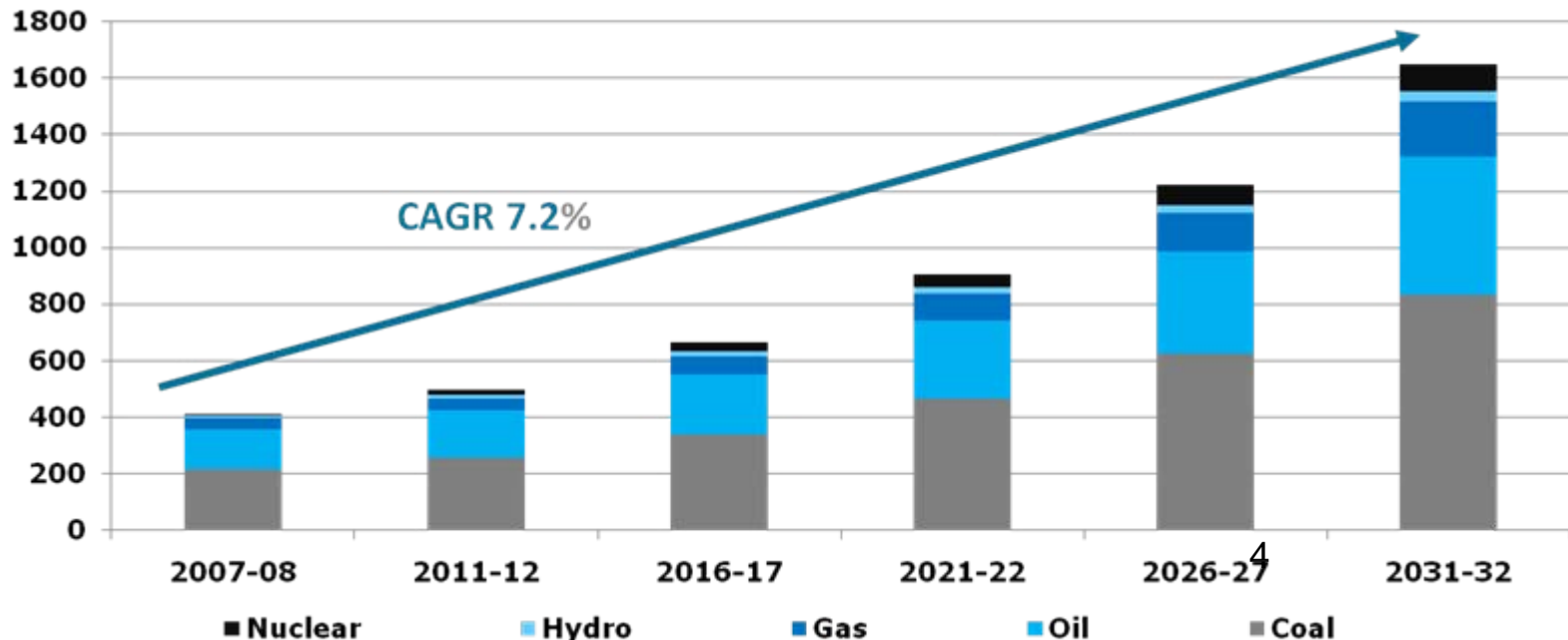
India – A Fast Growing Energy Market with Growth in Natural Gas Consumption more than World & Asia Pacific.

# India Energy Scenario - Demand

Year	Hydro (MTOE)	Nuclear (MTOE)	Coal (MTOE)	Oil (MTOE)	Gas		Total Energy Consumption in MTOE
					(MTOE)	BCM	
2007-08	11	4.4	216	140	40	33	410
2011-12	12	17	257	166	44	49	496
2016-17	18	31	338	214	64	71	665
2021-22	23	45	464	278	97	108	907
2026-27	29	71	622	365	135	150	1222
2031-32	35	98	835	486	197	219	1651
% Growth	6%	11%	6%	5%	7%		7.2

Source: Integrated Energy Policy, of the Gov., August 2006

Assumptions: (1) GDP growth assumed to be 9% (2) Population growth assumed to be 1.1% (3) Includes only commercial energy requirements



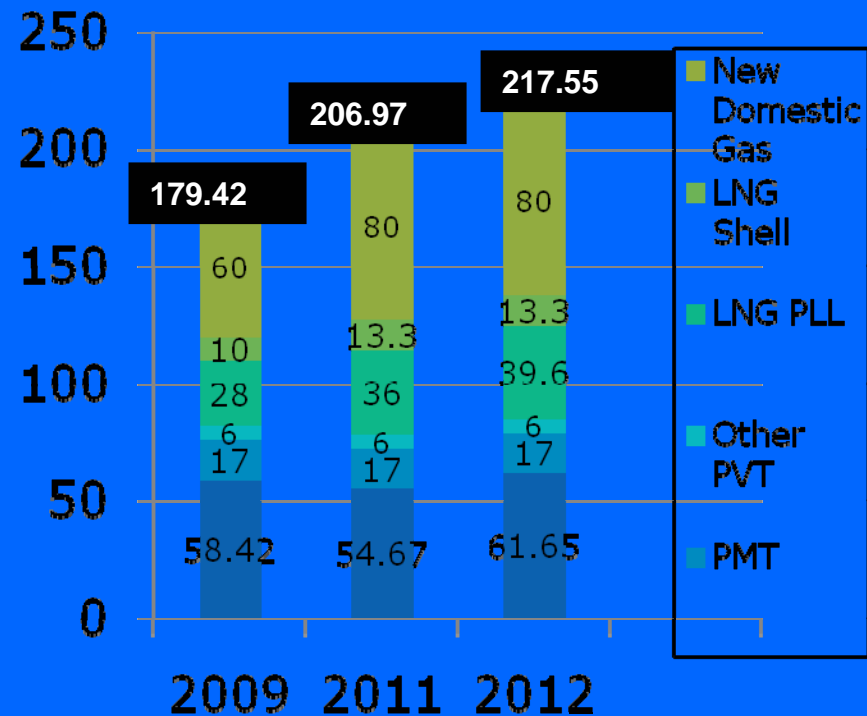
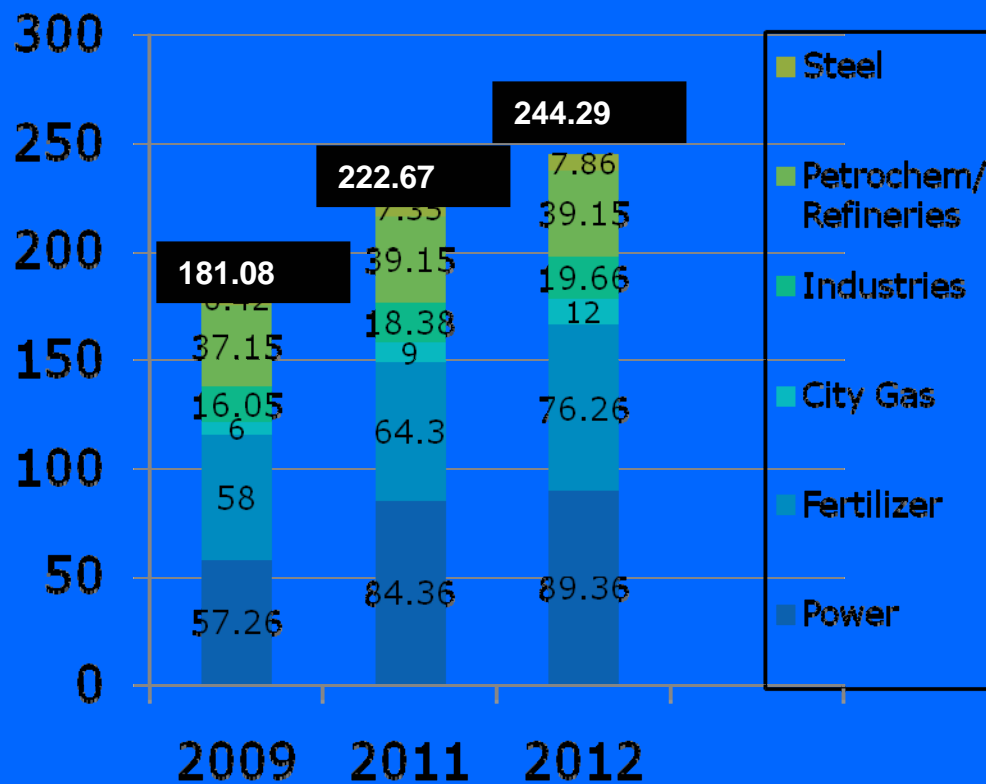
# India Energy Scenario - Supply

India Primary Energy Projected Supply (indigenous) by fuel (Mtoe)						
Year	2010	2015	2020	2025	2030	CAGR
Oil	45	45	55	55	50	0.53
Natural Gas	39	49	56	58	58	2.00
Coal	218	220	230	235	250	0.70
Nuclear Energy	8	14	22	29	32	7.18
Hydro electric	23	29	36	41	44	3.22
<b>Total</b>	<b>333</b>	<b>357</b>	<b>399</b>	<b>417</b>	<b>434</b>	<b>1.34</b>

Source: EIA statistics

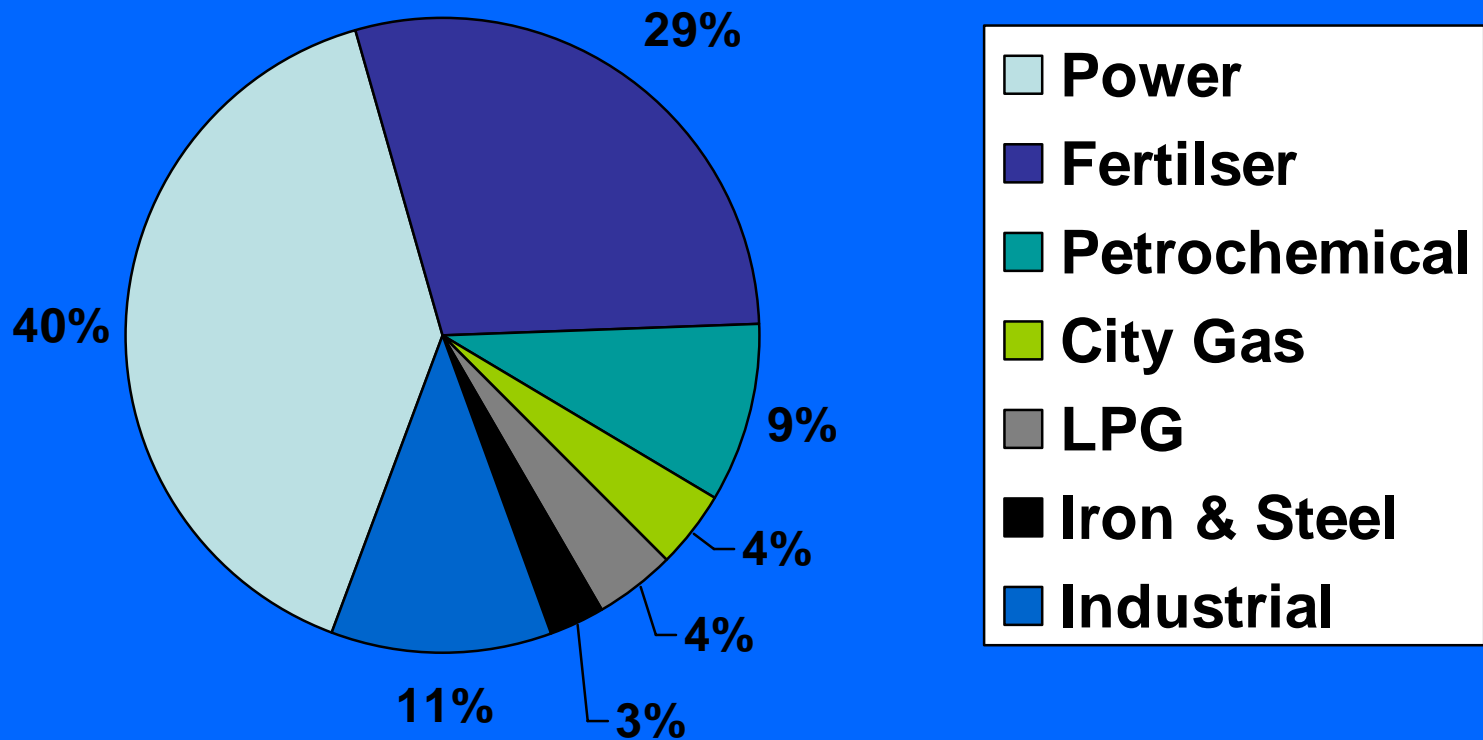
Energy Deficit in India (Mtoe)						
Year	2011-12	2016-17	2021-22	2026-27	2031-32	CAGR
Demand	496	665	907	1222	1651	6
Supply	333	357	399	417	434	1
<b>Gap</b>	<b>163</b>	<b>308</b>	<b>508</b>	<b>805</b>	<b>1217</b>	<b>11</b>

# India Gas – Demand Supply



MMSCMD	2009	2011	2012	2025 (AT Kearney study)
Demand	181	223	244	349
Supply	179	207	218	286
Gap	2	16	27	63

# Consumption Pattern Natural Gas



# Potential for LNG Supply

## A. Petronet LNG

Dahej 10.0

Kochi 2.5 12.5

B. Shell Hazira 3.0

C. Ratnagiri Gas Dabhol 5.0

D. GSPC LNG 5.0

Total (MMT) 25.5

(In MMSCMD) 100

# Supreme Court Judgment and its Implications

- Government sole owner of Gas
- Has unequivocal rights over natural assets
- No MOU can override PSC
- PSCs are supreme
- Allocation/utilization of gas to be decided by the Government
- Price to be approved by the Government on the basis of Price discovery
- EGOM to continue to exist
- Current price valid for five years
- Government to come out with comprehensive policy on energy security
- Government to lay down policy and law governing supply of Gas under PSC.
- RIL's Gas marketing rights not absolute. To conform to PSC & GOM.
- Exploration / Extraction of Gas & supply within domain of Government function for benefit of citizens.
- Private parties accountable to constitutional setup.

# Supreme Court Judgment and related Issues

- Will judgment attract foreign investments? Last NELP EXXON/Shell abstained.
- Will it be attractive to domestic investors?
- Technical know how in future.
- No clarity on fuel pricing.
- Are we moving to unified pricing?
- Will NTPC get gas at lower prices?
- PSC/GOM/ EGOM supreme
- Will RNRL / Reliance Power get quantity / tenure stipulated earlier?
- Future tenure of price - ?

# D – 6 GAS - SECTOR WISE ALLOCATION

<b>SECTORS (mmscmd)</b>	<b>FIRM</b>	<b>FALLBACK</b>	<b>TOTAL</b>
<b>Power</b>	<b>31.2</b>	<b>12.0</b>	<b>43.2</b>
<b>Fertilizer</b>	<b>15.5</b>	<b>-</b>	<b>15.5</b>
<b>Petrochemical</b>	<b>1.9</b>	<b>-</b>	<b>1.9</b>
<b>Refineries</b>	<b>5.0</b>	<b>6.0</b>	<b>11.0</b>
<b>Steel</b>	<b>4.2</b>	<b>-</b>	<b>4.2</b>
<b>Captive</b>	<b>-</b>	<b>10.0</b>	<b>10.0</b>
<b>LPG</b>	<b>3.0</b>	<b>-</b>	<b>3.0</b>
<b>CGD</b>	<b>0.8</b>	<b>2.0</b>	<b>2.8</b>
<b>Small AP Customers</b>	<b>1.0</b>	<b>-</b>	<b>1.0</b>
<b>TOTAL</b>	<b>62.6</b>	<b>30.0</b>	<b>92.6</b>

# Natural Gas Concerns & Issues

- **Uncertainty over Domestic Supplies**
- **Pricing of Gas**
- **GAS Utilisation policy**
- **Upstream Investment**
- **National Pipeline Grid**
- **Inadequate Infrastructure**
- **Fiscal Issues**
- **Policy & Regulatory uncertainties**

# Pricing of Gas

## A. Pricing

- Contentious Issue
- Uncertainty Continues
- Policy Clarity

## B. Multiple Pricing

- APM ONGC
- APM OIL
- Pre NELP Joint Ventures PMT RAVA.  
Based on PSC
- NELP Blocks  
Freedom to market, If Price Determined on arms Length basis
- LNG Long Term  
Based on Contractual Price Lined to Formula
- LNG Spot prices  
Varying Prices

## C. Sector Sensivity

- Power
- Fertiliser
- 70% Consumption Price Sensitive

## D. LNG Pricing

- Discriminatory Price A.P Buyers
- Linkage to JCC or BRENT
- Exploitation Countinues
- Asian Price Index Blended HUB Price

(Contd...)

# Gas prices in India

Gas Source	Price(\$MMBTU)	Gas Source	Price(\$MMBTU)
PMT RRVUNL	4.60	APM North East at Market Price	1.79
PMT Torrent	4.75	APM Power	1.79
PMT others	5.65	APM Fertilizer	1.79
Rava	3.50	APM City Gas	2.15
Rava Satellite	4.30	CB/OS -2 Cairn GPEC	4.75
KG D6	4.20	CB/OS -2 Cairn GTCL	4.60
APM North East- Power & Fertilizer	1.08	Olpad (NSA) Niko	5.50
APM North East- City Gas	1.29	North Balol (HOEC)	1.77
CB/OS -2 Cairn GSPC	5.50	*Dahej Term LNG	5.42
Hazira Niko – AGCL	4.61	Palej (HOEC)	3.50
Dholka	1.77		

# Pricing of Gas

## Common Pool Price Mechanism

### E. Price Pool Options

- Cost based pool covering all consumers & Suppliers (4 variants)
- Sectoral Pool Arrangement covering price sensitive sectors, Power & Fertiliser (2 variants)
- Auction pool based on competitive markets based on bids

### F. Need for Pooling

- Introducing new gas sources in the market
- Ensuring stable price signals for long gestation investment based on Gas
- Deepening the pipeline network to expand gas markets geographically
- Sending appropriate Price signals for efficient use of gas.

(Contd..)<sup>15</sup>

# Pricing of Gas

## G. Preferred Pooling Options

### G1. General Pool – Comprehensive compulsory without spots

Source	Volume (MMSCMD)	Wt. Average Price(\$/MMBTU)
ONGC/OIL	54.32	1.82
RIL-KGD6	57.14	4.20
PMT/Rava/ Rava St.	18.67	5.35
Long term RLNG	21.69	5.42
Other Gas	2.70	4.73

The weighted average price for this option comes to \$ 3.68  
mbtu. (Contd..)

# Pricing of Gas

## G2. Sectrol Pool – Individual Pools for Power & Fertiliser Sectors

Source	PMT/Rava/ Rava St.	KGD 6	APM	*Term LNG	Others
Supply to Power (MMSCMD)	5.41	24.4	23.38	5.13	1.27
Price(\$/MMBTU)	5.35	4.20	1.79	5.42	4.73
Supply to Fertilizer	4.22	14.14	13.47	9.35	0.02
Price (\$/MMBTU)	5.35	4.20	1.79	5.42	4.73

(Contd..) <sup>17</sup>

# Pricing of Gas

## H. Recommendations

- **Price Pools to be formed each for Power & Fertiliser Sector**
- **Pools should be notified by GOI**
- **Policy rules & guidelines to be notified**
- **All existing contracts for the sectors identified for pooling modified or novated.**

# Gas Utilisation Policy

## A. Stakeholders

- Gas Sector Cos
- Potential Gas Users
- Gas Producers
- Gas Transmission & Distribution Co.
- PNGRB
- Bureau of Energy Efficiency
- Electricity Regulators
- Relevant Organisations
- People

Contd..

# Gas Utilisation Policy

## B. Basic Requirement

- Input from all Stakeholder
- Explicitly state its objectives
- Explain Trade off choosing alternative Fuels
- Transparent
- Participative Process

## C. Short comings

- Allocations but does not spell out Utilisation policy
- Clarity on Objectives
- Analysis of Trade Offs
- Utilisation & Pricing

# Upstream Investments Concerns

- Whether Uniform well head pricing for all sectors retain value attractiveness of upstream investments
- Whether allocation of supplies to different sectors be consistent with the spirit of allowing marketing freedom for upstream players.
- How will subsequent review of gas utilization policy work with long term contracts?
- Transparency regarding pricing, gas utilization at NELP bidding stage itself?
- Does an upstream investor have confidence on availability / accessibility of pipeline infrastructure on a non-discriminatory base?
- Feasibility of investing easily in the entire gas value chain?

# Transportation of Gas

- **Pipeline Density too low**
  - India 3 KM/1000 sq. km
  - USA UK China 50 km/1000 sq. km
- **Existing connected market cannot absorb future supplies**
- **National Pipeline Grid**
  - Priority & focus for speedy implementation
  - Huge investment
  - Levy Cess
  - Pass on benefit of logistics & transport cost savings to end users
  - Work aggressively – aim 15,000 km by 2013-14
- **Huge Challenge**
  - From 11,000 km to 25,000 km?
  - Funding
  - Clarity & Speedy authorization & tariff determination
- **National Gas Highway Development Authority ?**
- **Importance of spur lines**
- **Connectivity to accelerate demand**
- **Integrated grid to link any source to any market**

# Impact of Inadequate Infrastructure

- **Overall Market Development**
  - Opening of new markets
  - Timely access to markets for new supplies
  - Regional surpluses
  - Potential LNG market in India
- **Gas Prices**
- **Investment across gas chain**

# Policy & Fiscal Issues

- In respect of fiscal issues will the players have clarity before investment decisions are made. There is lack of clarity in policy related issues. For instance
  - What price will Govt approve?
  - Whom will be the gas be sold.
  - Degree of govt. intervention in gas pricing & utilization.
  - Marketing freedom for upstream players.
- Unresolved Dispute
  - Tax concessions to NG
  - Tax Holiday
  - Defination of mineral Oil
- Anomoly must be corrected for better response in NELP IX

# Natural Gas Way Forward

- **Speedy creation of Infrastructure**
- **Formalise Intent & Role in Gas Market Development**
- **Develop End-use Market**
- **Reform on Gas Pricing policy**
- **Accord Financial Incentives**
- **Reduce / Exempt Taxes**
- **Simplify Approval Process**
  - **Large Gas End use Projects**
  - **Laying Common Carrier Pipelines**
- **Encourage Private & Foreign Investment in City Gas Distribution Sector**
- **Develop Detailed Regulatory Framework**
- **Regulations on Health Safety & Environmental & Technical Standards for Gas Industries**

# Conclusions

- Long term perspective
- The availability of gas is no longer an issue; its affordability is.
- Large appetite for gas in India
- Reduce dependence on Liquid Fuels and Improve NG share in Energy Basket.
- Indian Gas market will take off but will remain price sensitive
- Partnership between India and LNG supplying nations is vital.
- India has unique advantages it can leverage.
- What is important is that India must think creatively in the context of market realities.
- Long term supply agreements – not 5 years
- Smooth transition to mature gas markets.
- LNG buyers must realize that LNG will not be sold ‘cost plus’
- LNG sellers must realize that Global gas markets have changed. If they insists on pricing close to crude oil parity, LNG demand growth will stagnate
- Price stability and security of supplies key to mature market.
- Integration of all regional markets through National Gas Grid holds the key.

Thank You