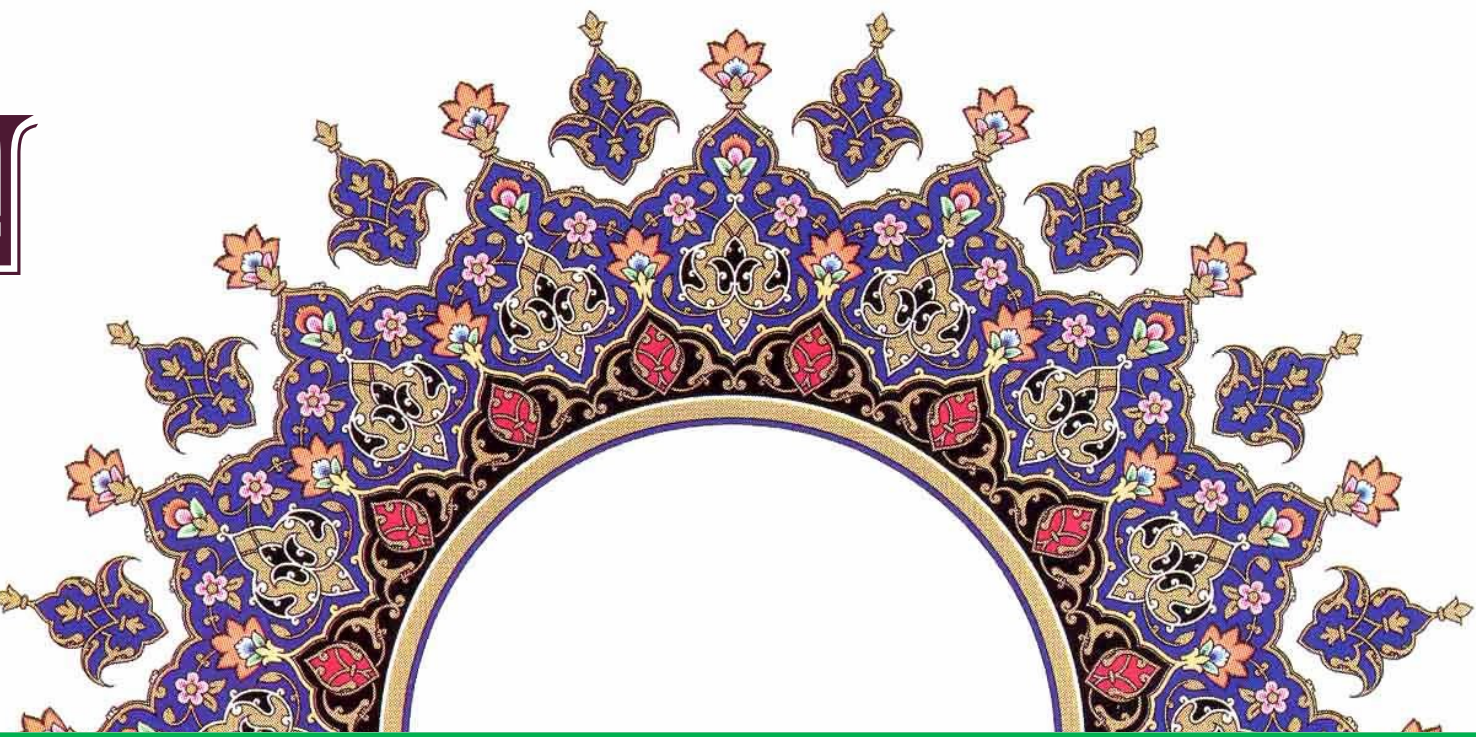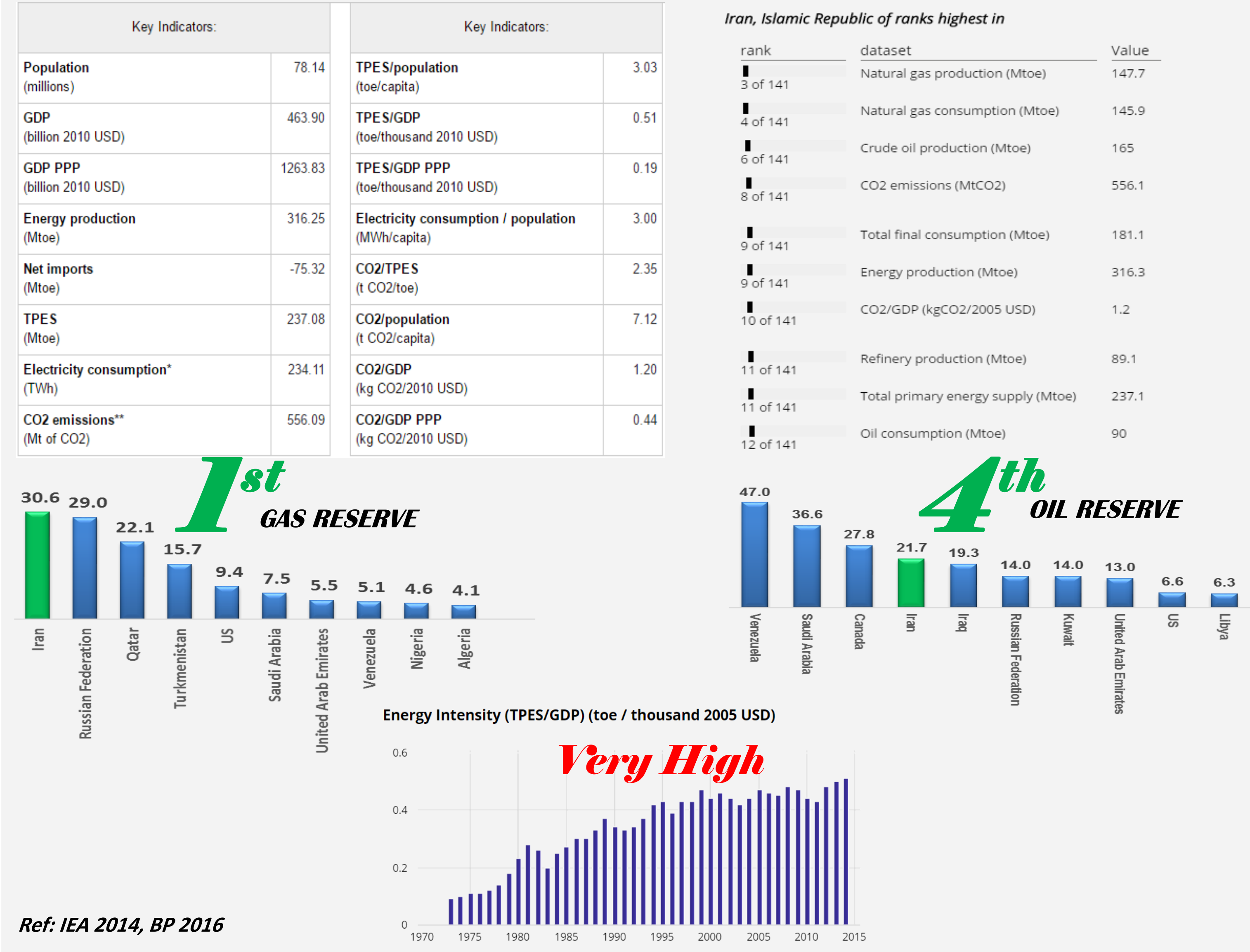# ENERGY EFFICIENCY POTENTIALS IN IRAN
## A precise look to one of the biggest energy producers
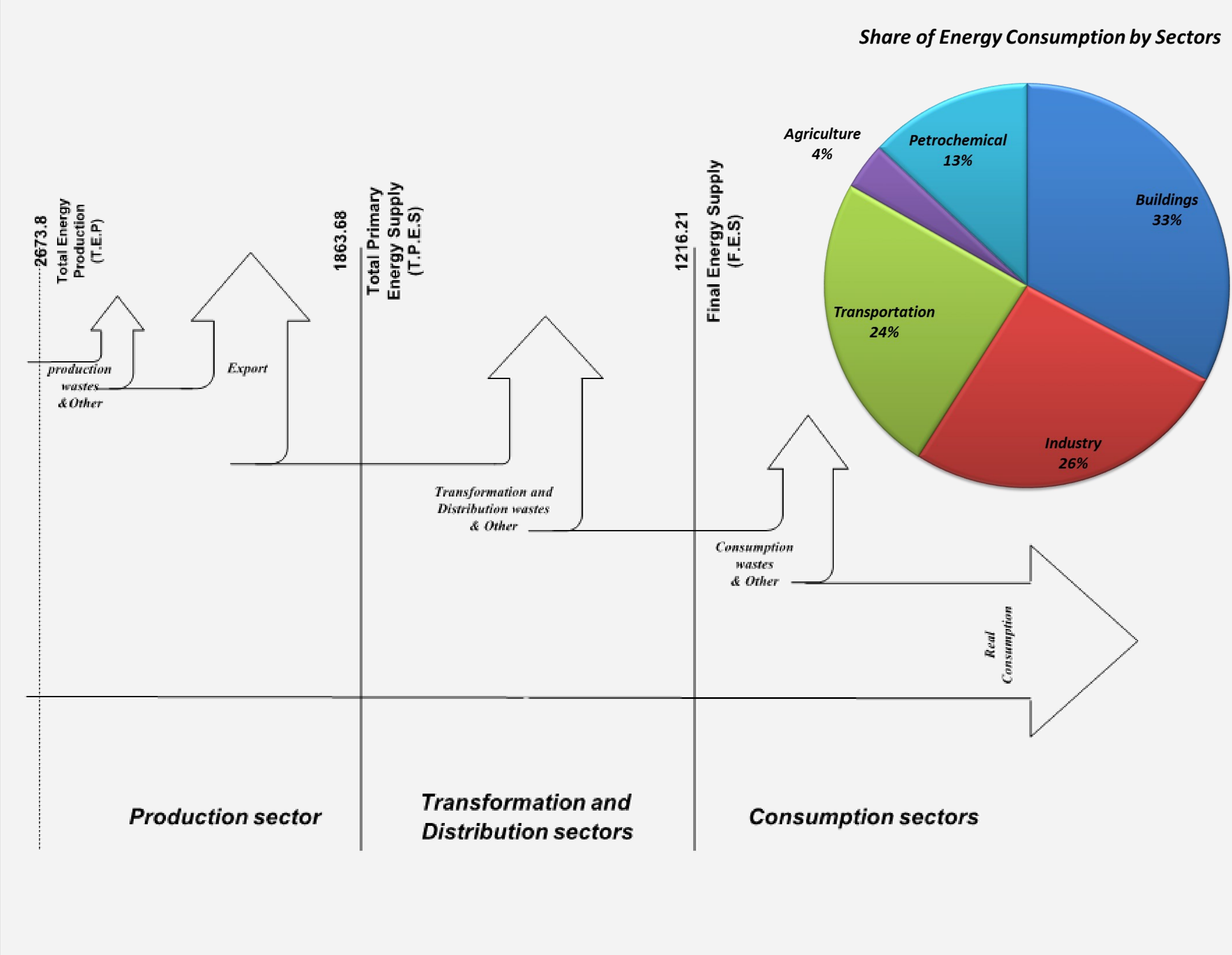
1-053-17+ Ali Khodamoradi, Faraz Sojdei

## Key Indicators

| Key Indicators: | | Key Indicators: | |
|---|---|---|---|
| Population (millions) | 78.14 | TPES/population (toe/capita) | 3.03 |
| GDP (billion 2010 USD) | 463.90 | TPES/GDP (toe/thousand 2010 USD) | 0.51 |
| GDP PPP (billion 2010 USD) | 1263.83 | TPES/GDP PPP (toe/thousand 2010 USD) | 0.19 |
| Energy production (Mtoe) | 316.25 | Electricity consumption / population (MWh/capita) | 3.00 |
| Net imports (Mtoe) | -75.32 | CO2/TPES (t CO2/toe) | 2.35 |
| TPES (Mtoe) | 237.08 | CO2/population (t CO2/capita) | 7.12 |
| Electricity consumption* (TWh) | 234.11 | CO2/GDP (kg CO2/2010 USD) | 1.20 |
| CO2 emissions** (Mt of CO2) | 556.09 | CO2/GDP PPP (kg CO2/2010 USD) | 0.44 |

**Iran, Islamic Republic of ranks highest in**

| rank | dataset | Value |
|---|---|---|
| 3 of 141 | Natural gas production (Mtoe) | 147.7 |
| 4 of 141 | Natural gas consumption (Mtoe) | 145.9 |
| 6 of 141 | Crude oil production (Mtoe) | 165 |
| 8 of 141 | CO2 emissions (MtCO2) | 556.1 |
| 9 of 141 | Total final consumption (Mtoe) | 181.1 |
| 9 of 141 | Energy production (Mtoe) | 316.3 |
| 10 of 141 | CO2/GDP (kgCO2/2005 USD) | 1.2 |
| 11 of 141 | Refinery production (Mtoe) | 89.1 |
| 11 of 141 | Total primary energy supply (Mtoe) | 237.1 |
| 12 of 141 | Oil consumption (Mtoe) | 90 |

### 1st GAS RESERVE
Iran 30.6, Russian Federation 29.0, Qatar 22.1, Turkmenistan 15.7, US 9.4, Saudi Arabia 7.5, United Arab Emirates 5.5, Venezuela 5.1, Nigeria 4.6, Algeria 4.1

### 4th OIL RESERVE
Venezuela 47.0, Saudi Arabia 36.6, Canada 27.8, Iran 21.7, Iraq 19.3, Russian Federation 14.0, Kuwait 14.0, United Arab Emirates 13.0, US 6.6, Libya 6.3

**Energy Intensity (TPES/GDP) (toe / thousand 2005 USD)** — *Very High*

*Ref: IEA 2014, BP 2016*

## Iran's Energy Flow

**Share of Energy Consumption by Sectors**
- Buildings 33%
- Industry 26%
- Transportation 24%
- Petrochemical 13%
- Agriculture 4%

2673.8 Total Energy Production (T.E.P) → 1863.68 Total Primary Energy Supply (T.P.E.S) → 1216.21 Final Energy Supply (F.E.S)

production wastes & Other — Export — Transformation and Distribution wastes & Other — Consumption wastes & Other — Real Consumption

Production sector | Transformation and Distribution sectors | Consumption sectors

## Energy policies and regulations

### General Policies of Energy Consumption Reform (2011)

Energy Intensity shall be halved till 2021 (with comparison to base year of 2011) with prioritizing improvement of Energy Efficiency and Productivity, Incentives and Penalties for improving Specific Energy Consumption (Process & Equipment), Development of Energy Standards and Labelling, enhancement of Energy Efficiency and Productivity awareness.

**Third to Sixth National Economic, Social and Cultural Development Plan (2001-2020)**
**Energy consumption reform Act (2011)**
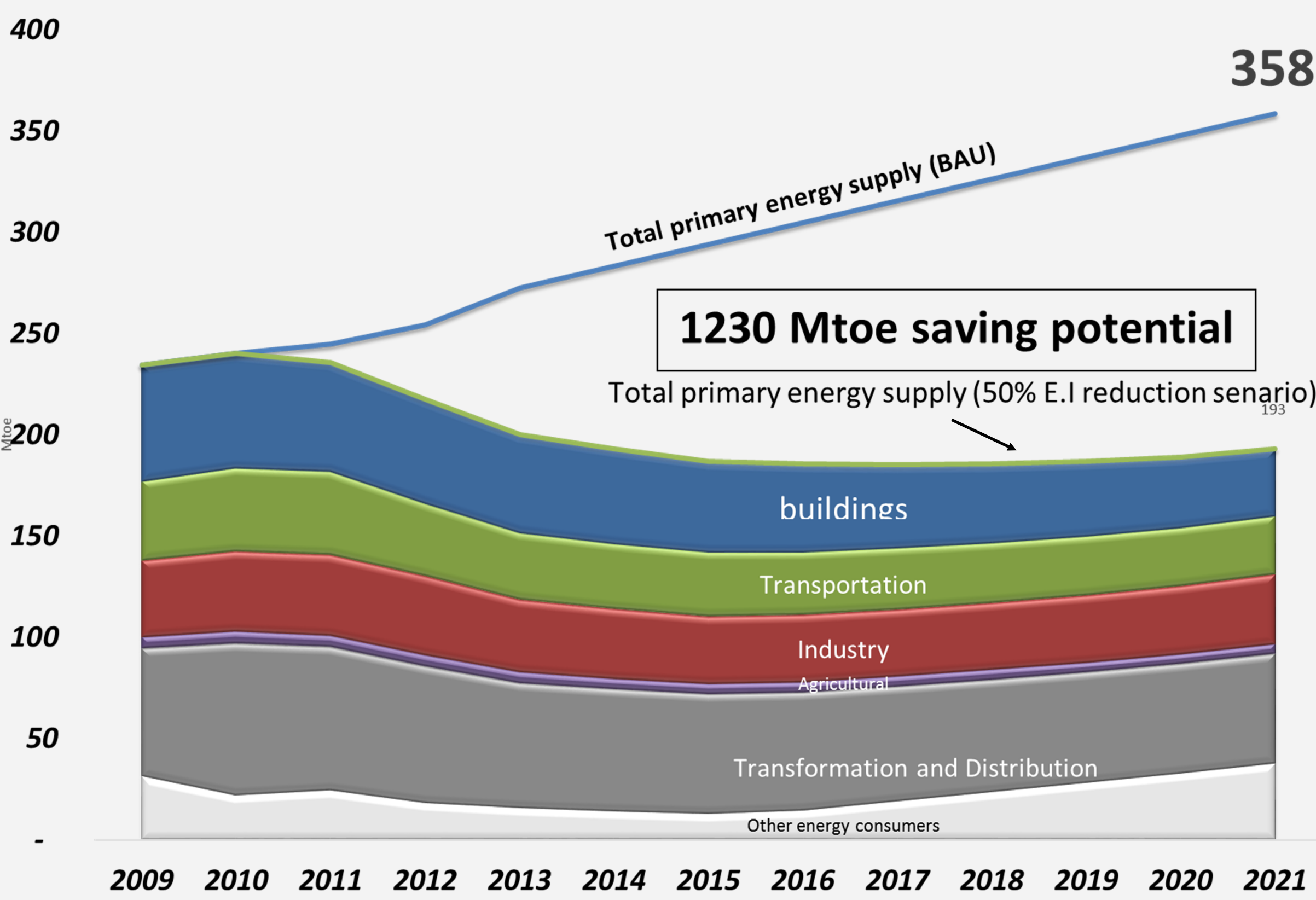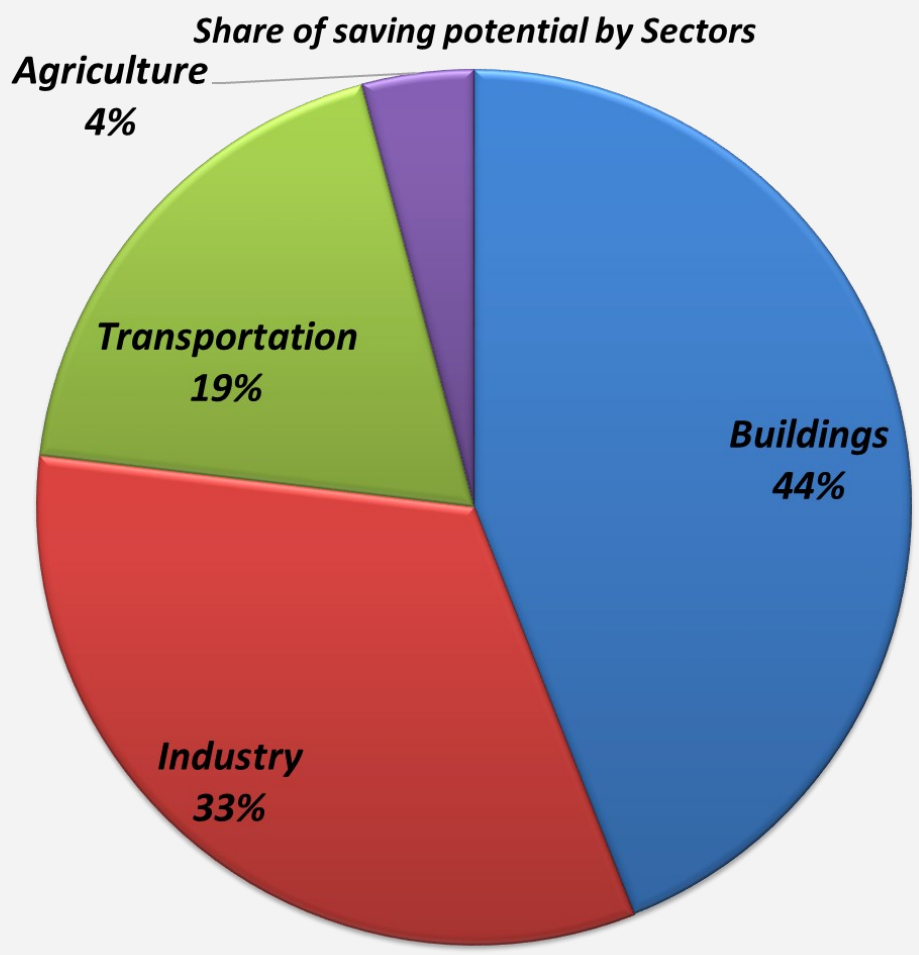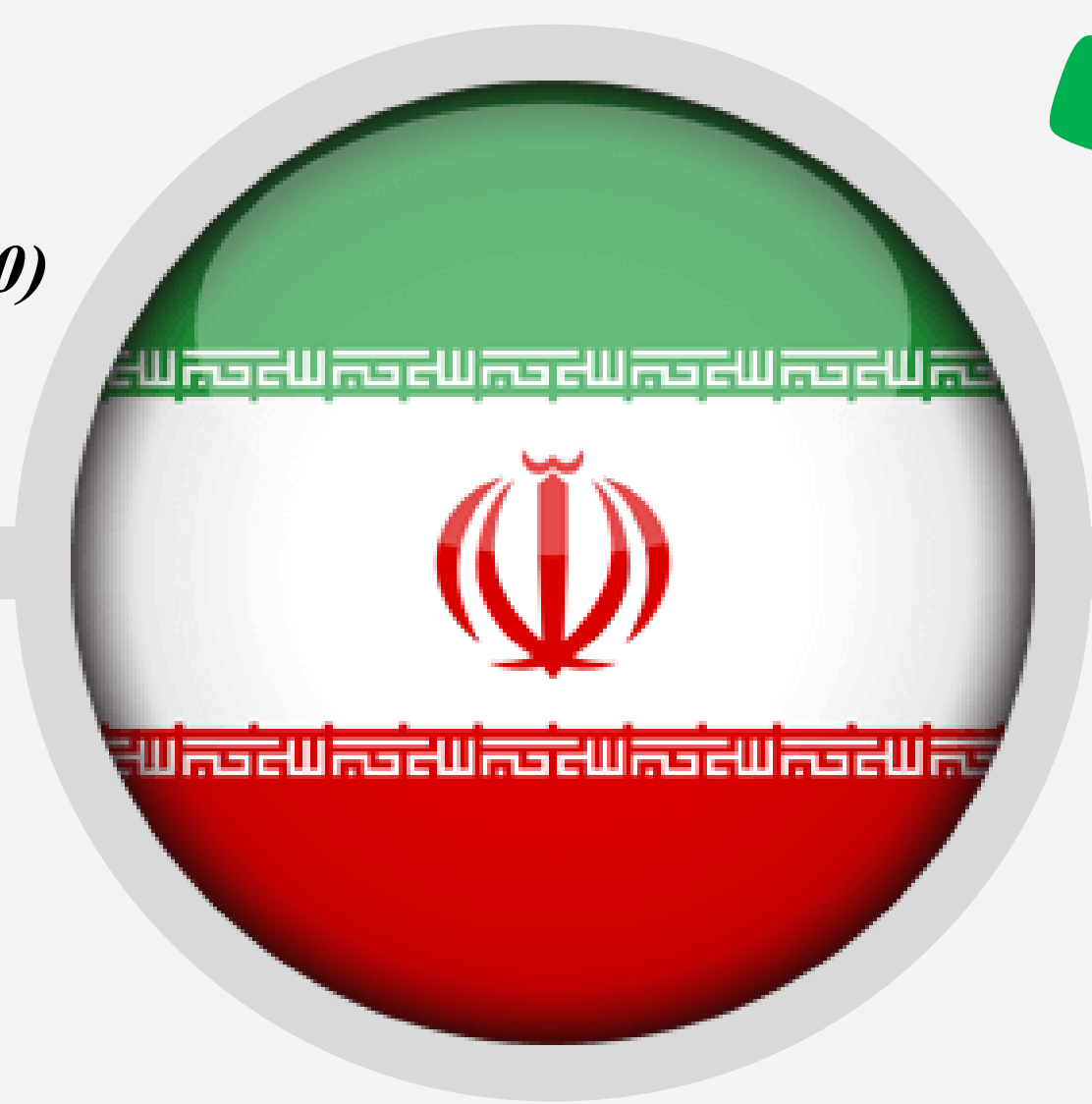**Targeted Subsidies Reform Act (2010)**

# 50% Energy INTENSITY REDUCTION
## FROM 2010 TO 2021

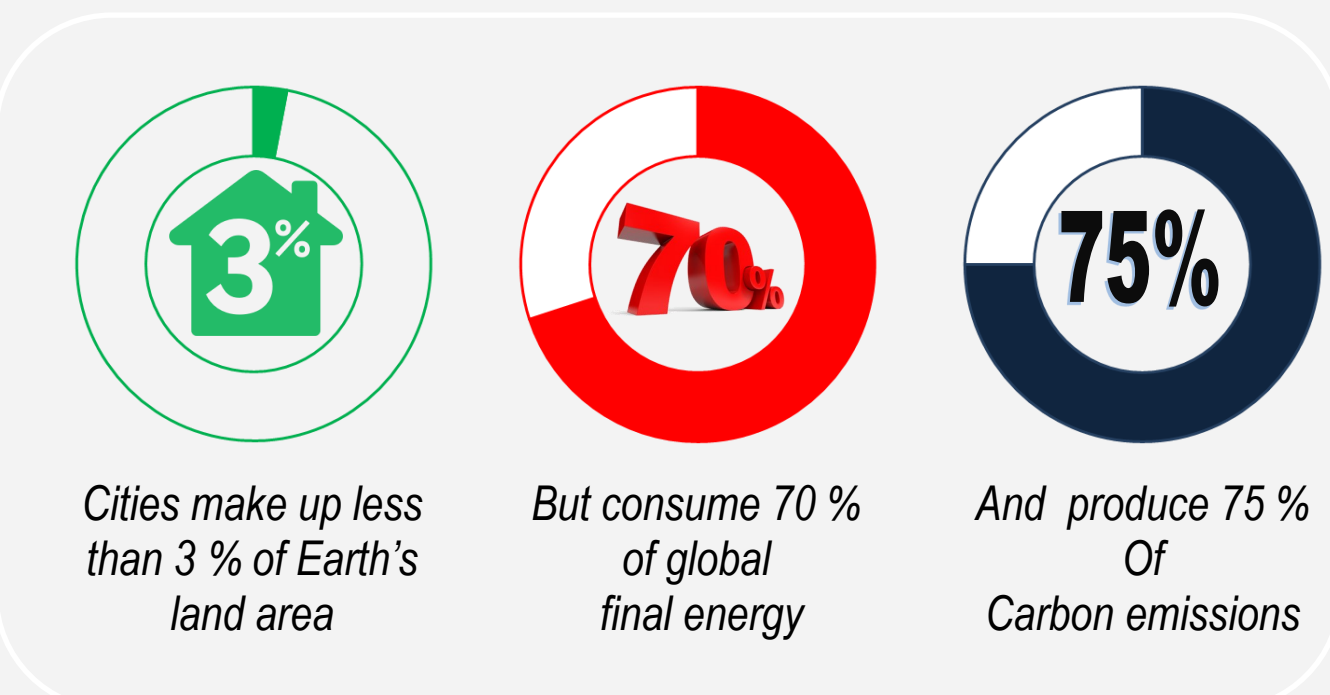### How can we translate our policies

## 1230 Mtoe ENERGY saving potential

**Assumptions**
- Halving of energy intensity by 2021 (in comparison to base year 2011)
- the energy intensity reduction is linear.
- Average of GDP growth rate based on governmental policies till 2021 is 6%
- Population growth rate 1.47% (to calculate Buildings energy consumption sector)

**Share of saving potential by Sectors**
- Buildings 44%
- Industry 33%
- Transportation 19%
- Agriculture 4%

358

**Total primary energy supply (BAU)**

**1230 Mtoe saving potential**
Total primary energy supply (50% E.I reduction senario)

buildings — Transportation — Industry — Agricultural — Transformation and Distribution — Other energy consumers

2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

## Why Buildings

### By 2050
### 70% live in cities of the global population will

- 3% Cities make up less than 3 % of Earth's land area
- 70% But consume 70 % of global final energy
- 75% And produce 75 % Of Carbon emissions

**THE GLOBAL GOALS For Sustainable Development**

1. Flexibility in amount of investment.
2. Highest RE feed-in-tariff in buildings sector (21 ¢/kWh)
3. Numerous developed standards for appliance energy labelling.
4. One of the most effective factors on improvement of energy intensity (as do not contribute in As buildings do not contribute in increasing of GDP).
5. Having a reasonable positive effect on behavioural energy consumption pattern.
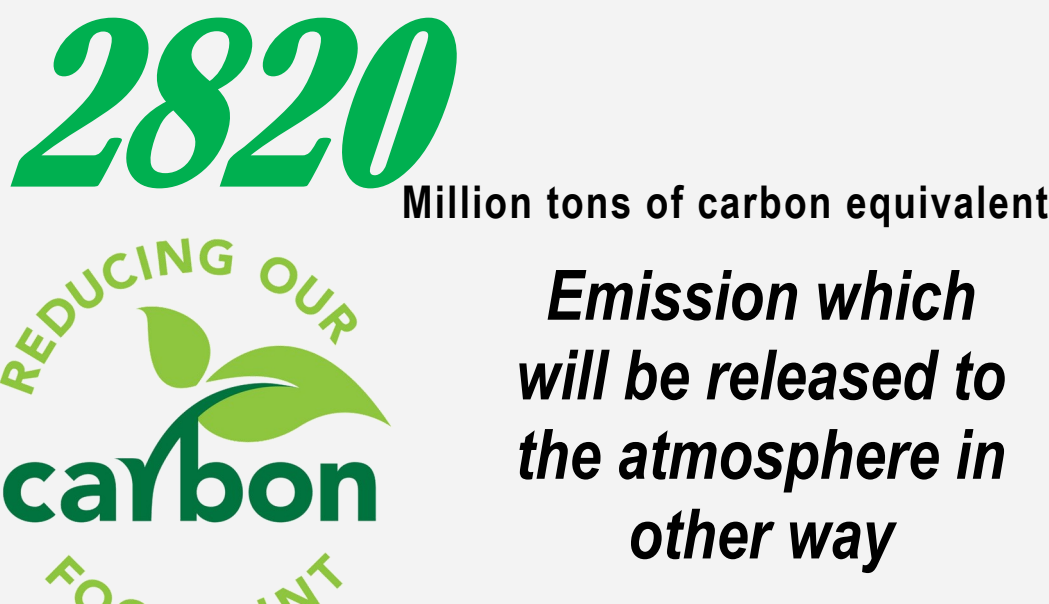6. Most EPC best practises are accessible in building sector.

## Conclusion

**IRAN can go beyond its NDC's commitments if profited by int'l support.**
IRAN's NDC: **4%** (unconditional) and **12%** (conditional to int'l support) carbon emission reduction comparing to its BAU

## 185 bEuro investment potential
## To reach 1230 Mtoe Energy saving
**IN 10 YEARS**

### 2820 Million tons of carbon equivalent
Emission which will be released to the atmosphere in other way

REDUCING OUR carbon FOOTPRINT

**THIS POTENTIAL COULD MAKE IRAN THE BEST AND MOST PROFITABLE MARKET FOR ENERGY COSERVATION PROJECTS**

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Love's path is Path whereof the shore is none
And there, unless they surrender their soul, remedy is none.
Every moment that to love thou givest thy heart is a happy moment,
In the right work, need of praying to God to be directed aright is none.

(Hafez)

راهی است راه عشق که هیچش کناره نیست         آن جا جز آن که جان بسپارند چاره نیست
هرگز دل من ز عشق کوش بود             در کار خیر حاجت هیچ استخاره نیست
حافظ