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## Clean Coal Power Plants

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# Clean Coal Power Plants

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## Situation

- On a global basis, the gulf region falls behind in diversifying the sources of energy and only rely on gas and fuel
- Coal is used as an alternative source of energy in many countries, such as the United States, except the Gulf countries

## Problems

- The main sources of energy in the gulf are fuel and gas, which are limited and will diminish in approximately 37 years [1]
- Many green sources have high costs yet low efficiency such as solar energy
- The sources of energy the gulf is depending on, such as gas and fuel, are not environment friendly

## Solutions

- The UAE are planning to decrease the reliance on gas and fuel, and increase the usage of coal by 14% [2]

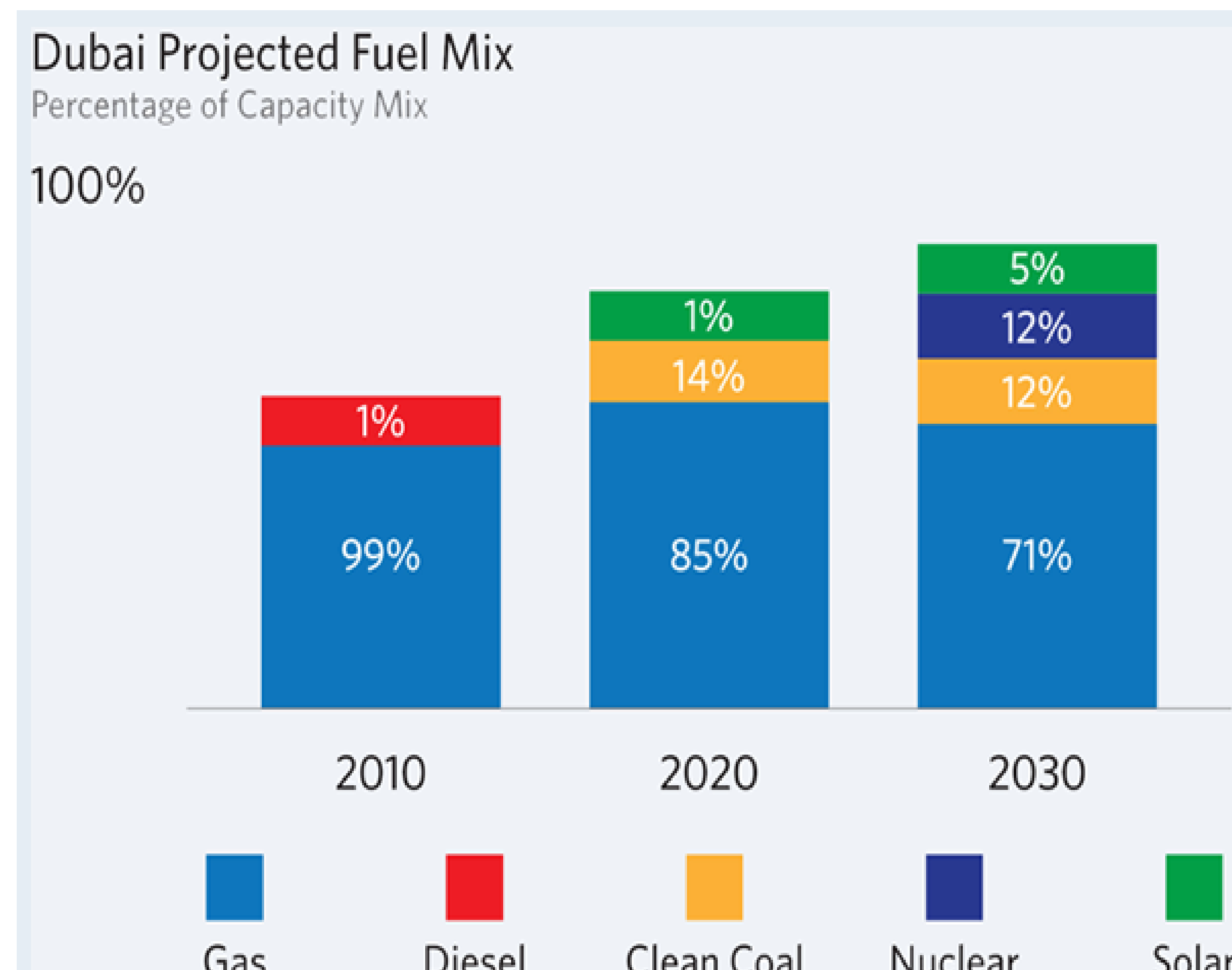


Figure 1: Dubai Future Plan of Diversifying Sources [2]

- Coal is the most efficient alternative source of energy Clean coal technologies such as Integrated Gasification Combined Cycle (IGCC) will be used as a plant to generate electricity

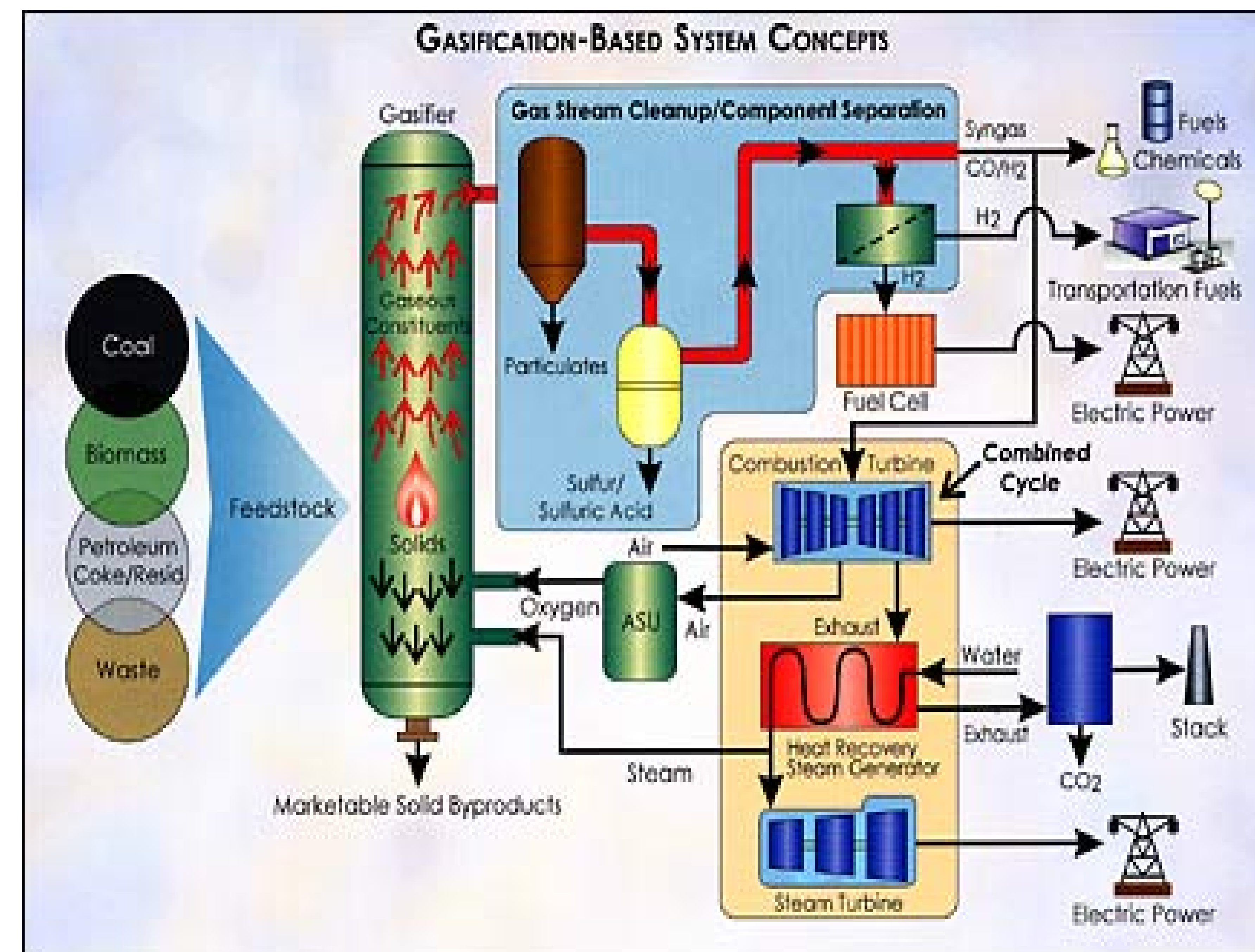


Figure 2: Gasification-Based System Concepts [3]

- Carbon capturing technology, specifically Pre-combustion, will be used to lower carbon dioxide emissions in such a way to diminish its impact as a green house gas by converting it into a useful substance utilized in geological technologies

## References

[1] "When will fossil fuel reserves be diminished :<http://www.sciencedirect.com/science/article/pii/S0301421508004126>, September. 27,2008 [Oct. 18,2013]."  
 [2] "Dubai to get 24% of its power from nuclear, clean coal by 2030: <http://www.arabianbusiness.com/dubai-get-24-of-its-power-from-nuclear-clean-coal-by-2030--385811.html>, March.9, 2011[Oct. 22, 2013]."  
 [3] "GASIFICATION TECHNOLOGY R&D: <http://energy.gov/fe/science-innovation/clean-coal-research/gasification>, Nov.18, 2009[Oct. 27, 2013]."  
 [4] "What is Carbon Capture and Storage : <http://www.bigskyco2.org/whatisit>, [ Oct. 30, 2013]"  
 [5] "Carbon Storage : [http://www.netl.doe.gov/technologies/carbon\\_seq/faqs/carbon-capture.html](http://www.netl.doe.gov/technologies/carbon_seq/faqs/carbon-capture.html), [Nov. 3<sup>rd</sup>,2013]"

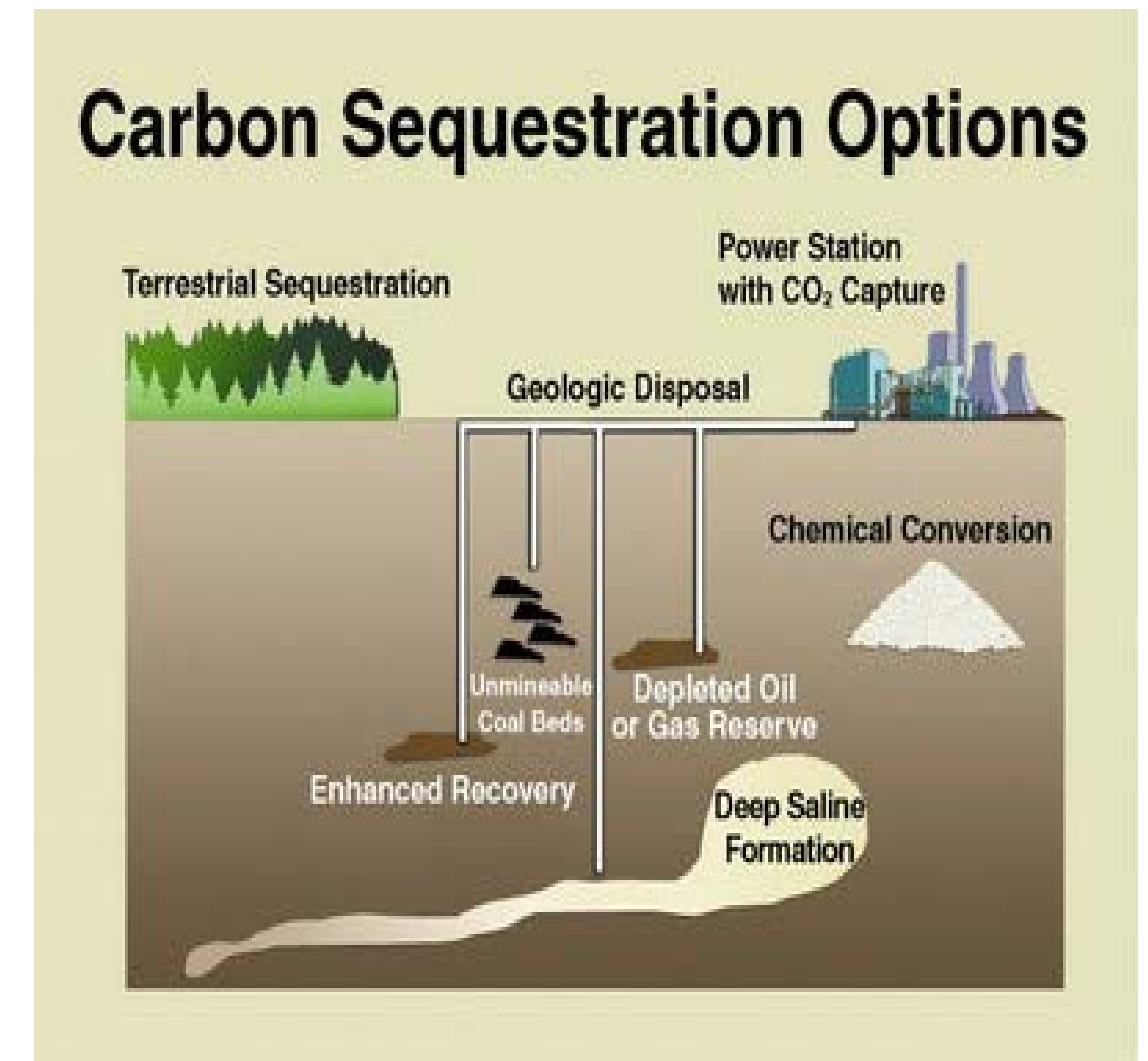


Figure 3: Clean Coal Plant and Carbon Capturing [4]

## Evaluation

- Pre-combustion captures only 25% of carbon dioxide that is emitted by coal [5]
- Oxy-combustion is a system that has the potential to capture 100% of carbon dioxide's emissions but it requires equipment of high energy and cost [5]
- The United Arab Emirates (UAE) does not have enough amount of coal production in order to apply the IGCC power plant, therefore it will have to import from different countries
- UAE National capacity building is also crucial aspect that we should consider while building such power plants, therefore we have to ensure the provision of proper trainings