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CO2 EOR Modeling and performance prediction in conventional oilfield

Mahammad Valiyev, Tianwei Li

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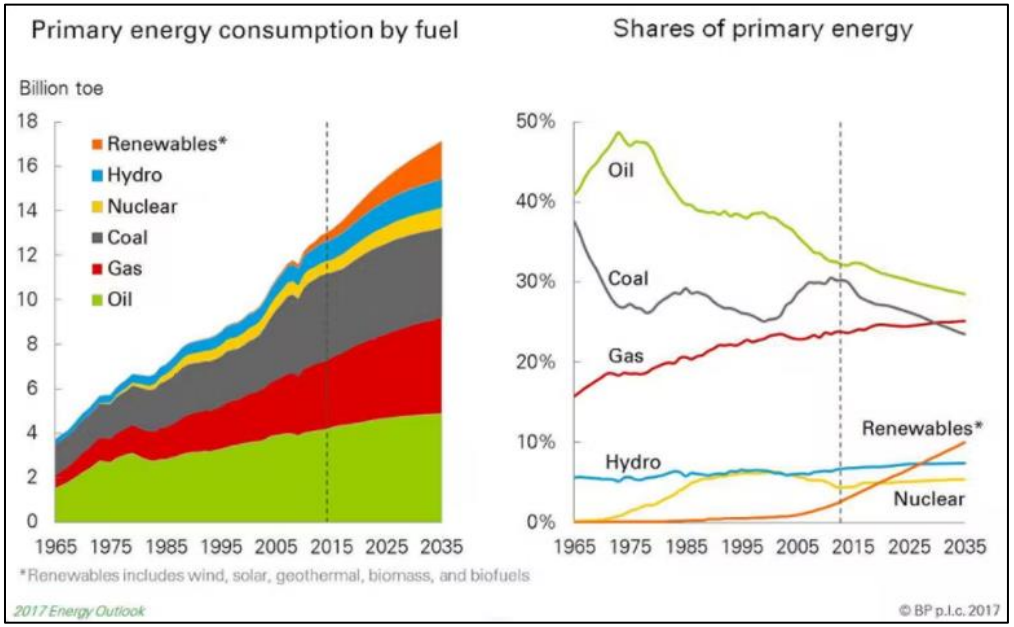
Contents

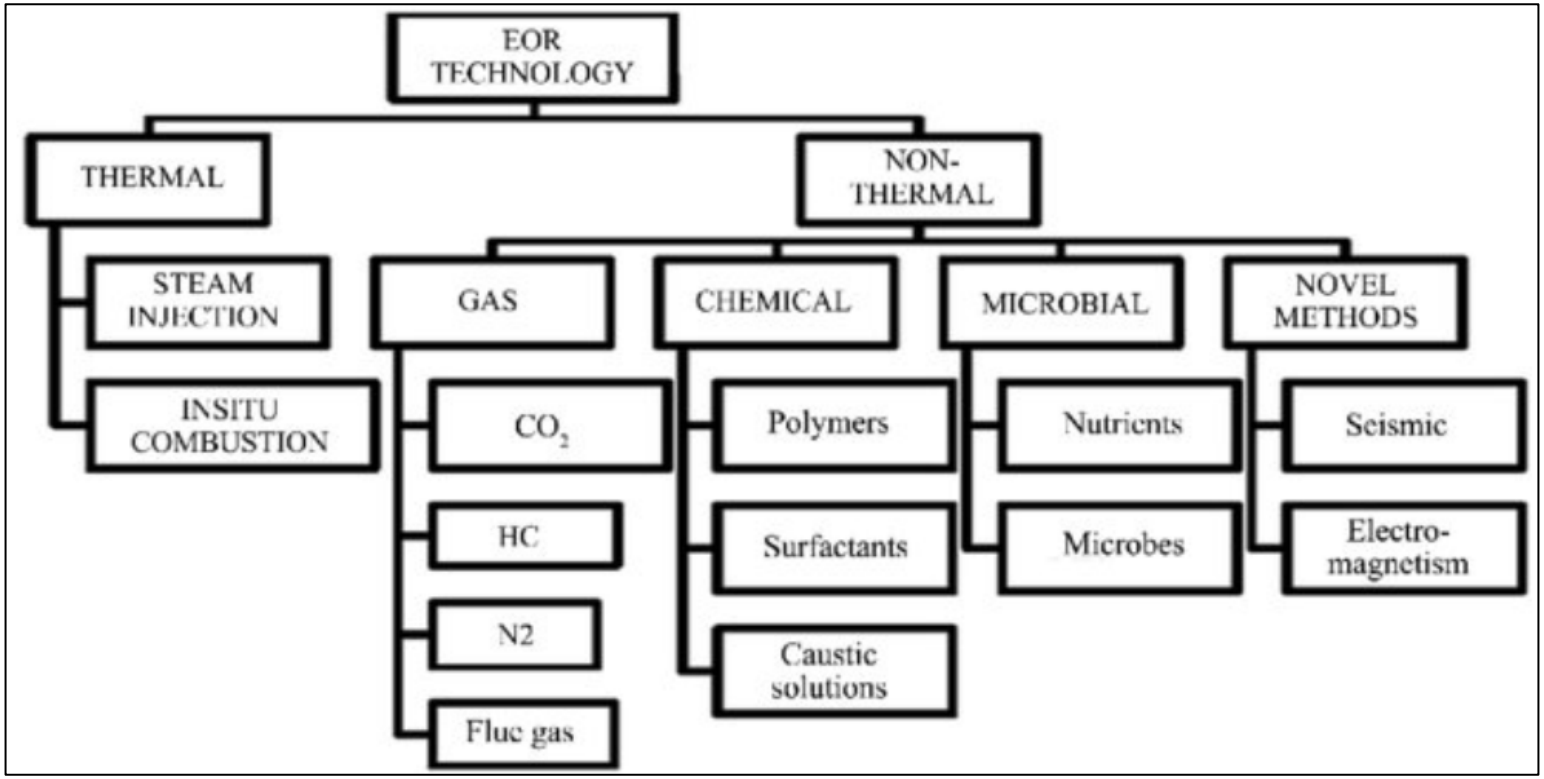
- Problem statement
- Literature review
- Overview of workflow
- Results
- Discussion and conclusion

Problem statement

- Oil & gas are still predicted to be dominant source of energy in 2035
- Prediction of an increased demand in Oil & gas
- Up to 50% of hydrocarbons can be recovered by the of primary & secondary recovery methods
- EOR techniques are the most effective for producing the rest
- CO2 injection is one of the most commercially successful tertiary recovery methods & helps with greenhouse gas emission reduction



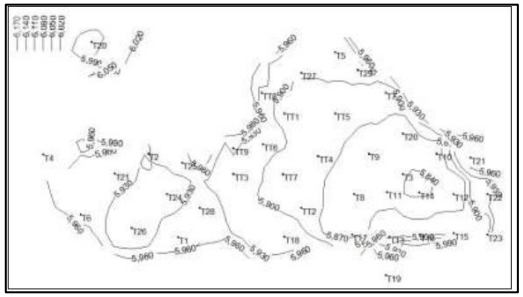
Literature review

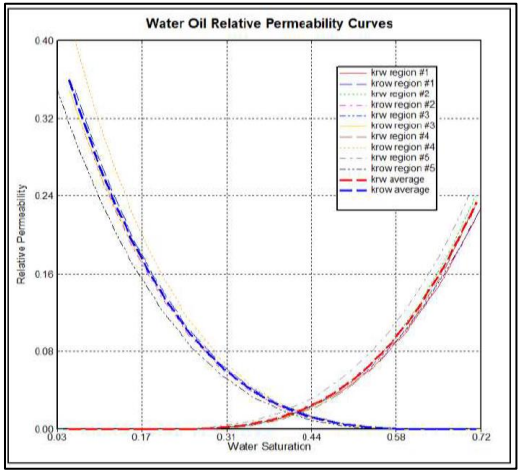


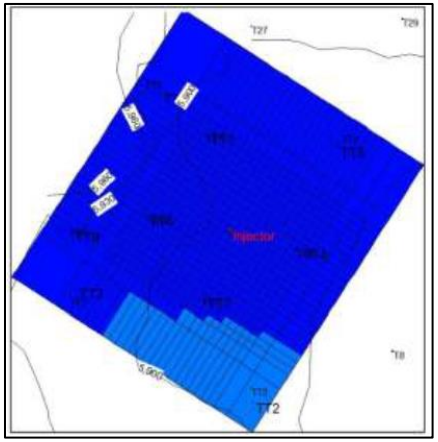
Jenkins et al., 2019

Workflow overview

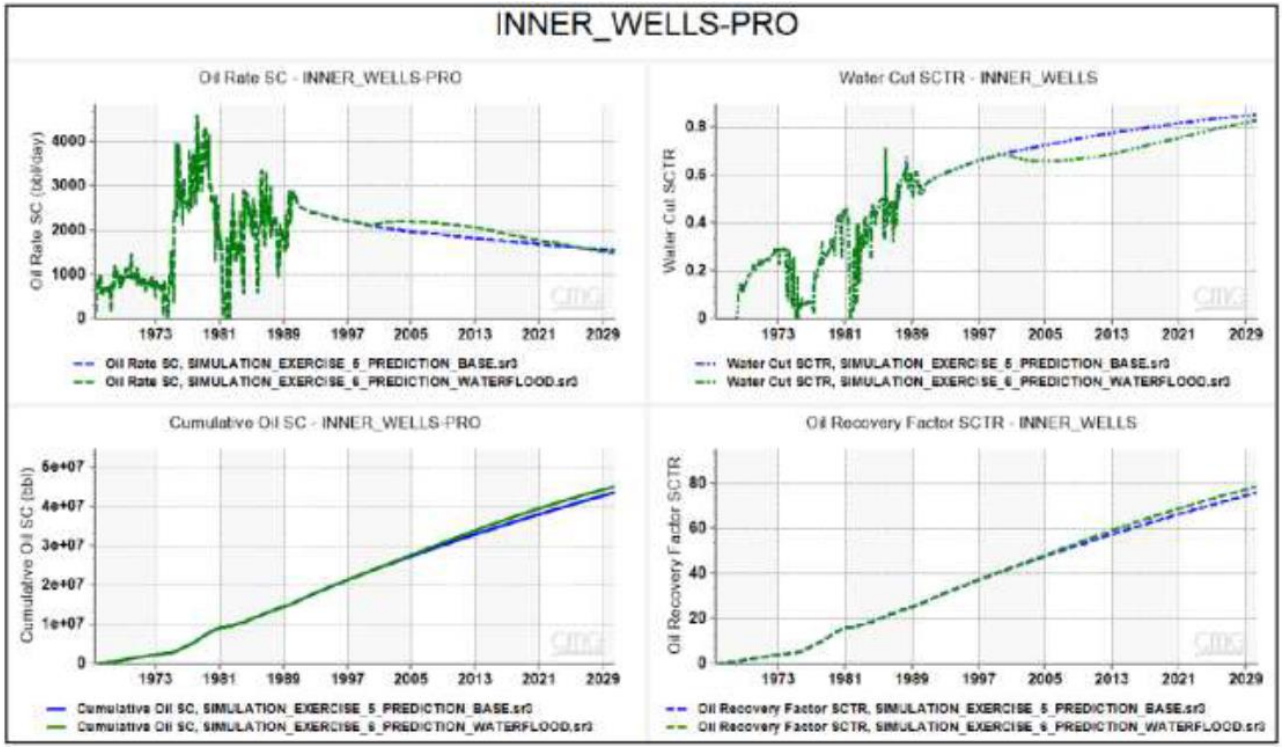
- Definition of structure and dimensions
- Gridding
- Rock & fluid properties
- Well modeling & Initial conditions definition
- Simulation of case 1 & case 2





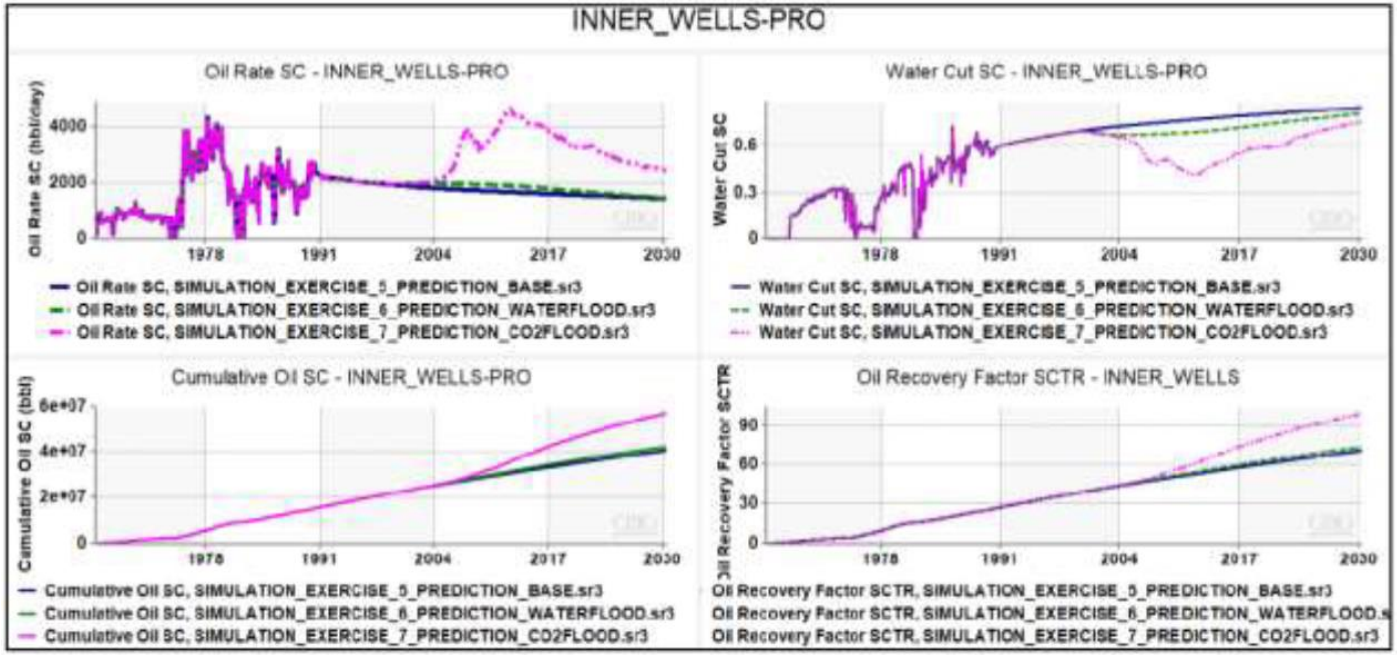


Results



Oil rate, water cut, cumulative oil rate and oil recovery for case 1 (waterflooding only)

Results



Oil rate, water cut, cumulative oil rate and oil recovery for case 2 (waterflooding & CO2 injection)

Discussion and conclusion

- In this study, a structured workflow for reservoir modeling, waterflooding and CO2-EOR injection is presented.
- Performance differences between cases without any improved oil recovery methods, waterflooding only and waterflooding & CO2-EOR injection processes have been demonstrated.
- Both waterflooding and CO2 injection can lead to an increased oil rate and cumulative recovery, while having lower water cut levels
- Potential gain from CO2 injection is much higher compared to water flooding
- To make this study even more comprehensive and insightful, economic analysis can further be conducted.

Thank You

Questions???