

# Themes for next Program

1. Geothermal generation by using high temperature in preserver (renewable energy)
2. Wind power/Ocean current power generation to supply offshore oil & gas production facilities (renewable energy)
3. Cost reduction technology for flammable gas removal and re injection at production facilities (global warming)
4. Establishment of oil spill drift forecast simulation method by using local ocean current monitoring by aerial drone (marine environment)
5. Hydrogen related technologies (global warming)
6. Safety related techs including NUF (normally unattended facilities) and robotics (the safety of the working environment)
7. Water treatment related technologies (marine environment)

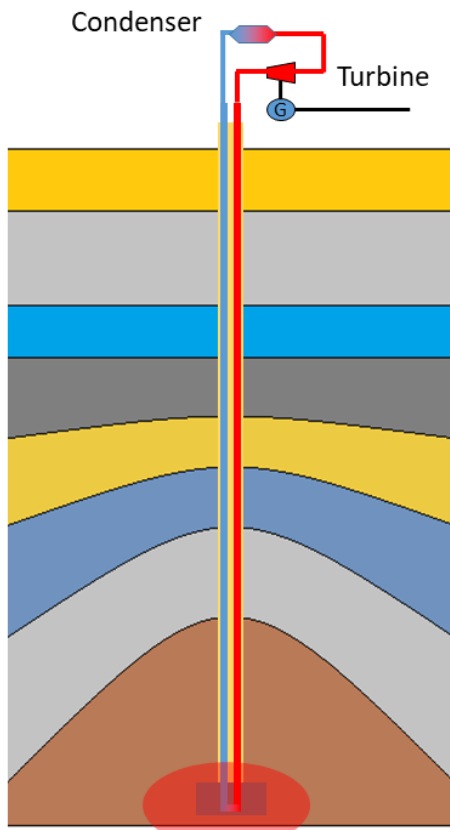


# Themes for next Program

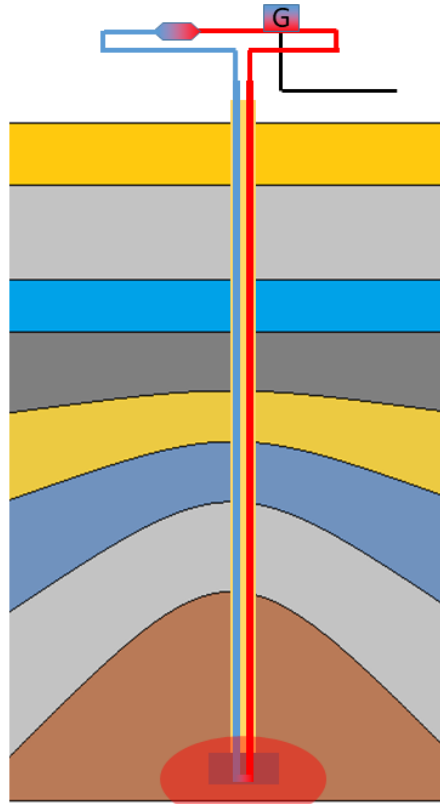
## 1. Geothermal generation by using high temperature in preserver (renewable energy)

Concept design:

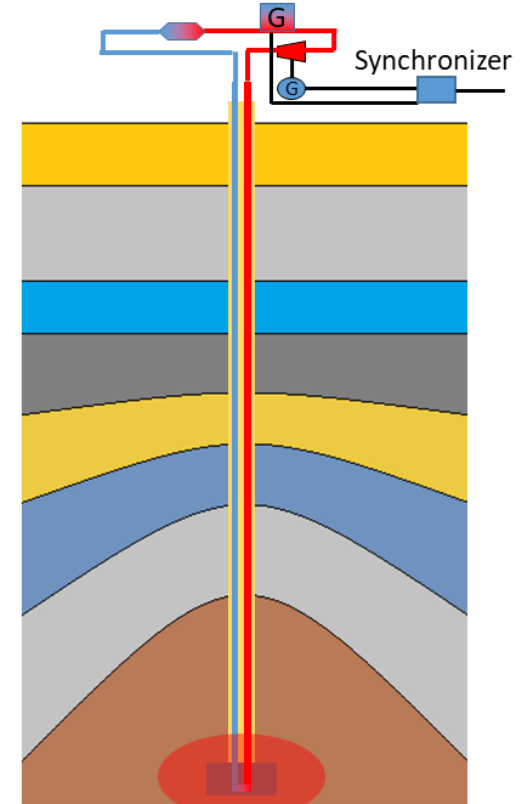
**Concept 1: Turbine**



**Concept 2: TEG**  
Thermoelectric generator (TEG)



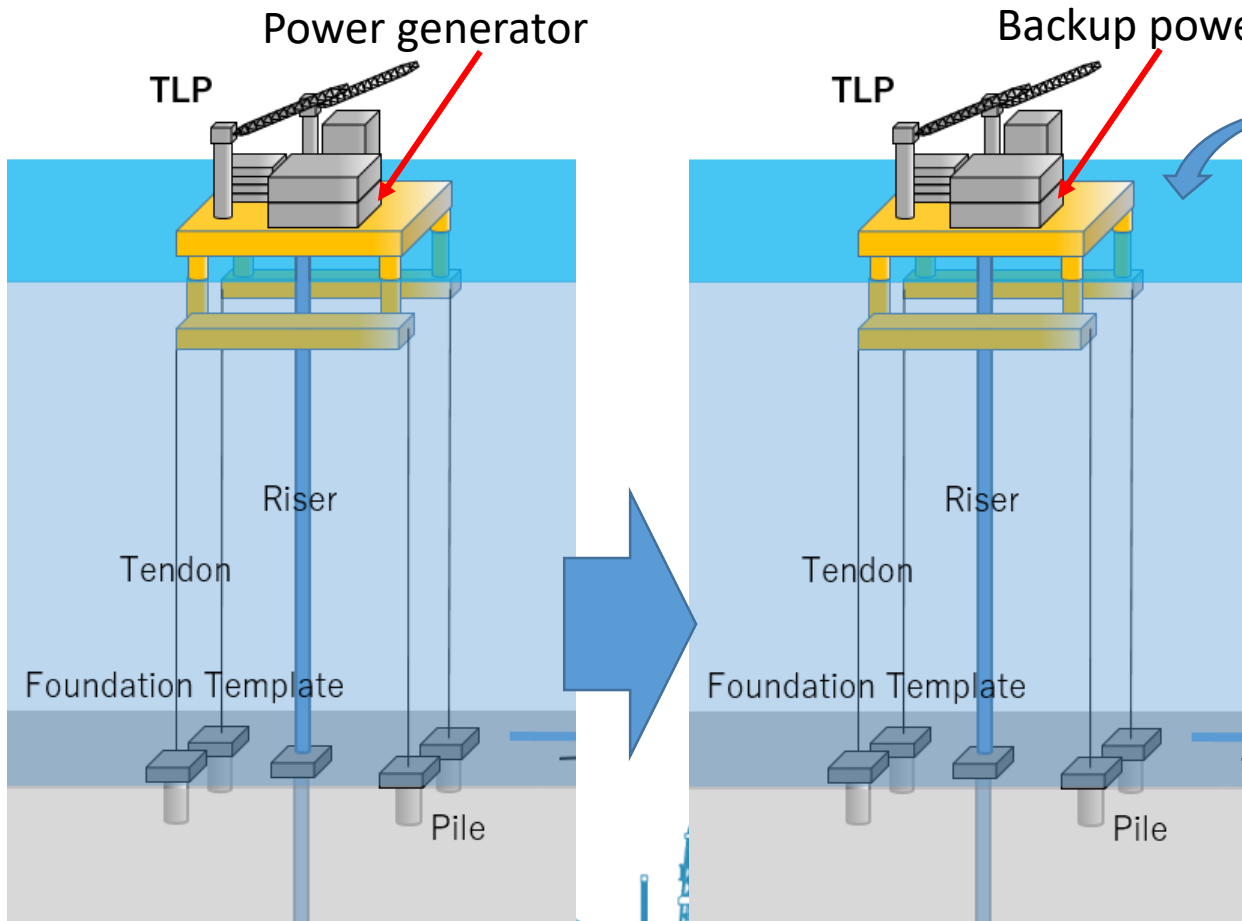
**Concept 3: Combined**  
Thermoelectric generator (TEG)



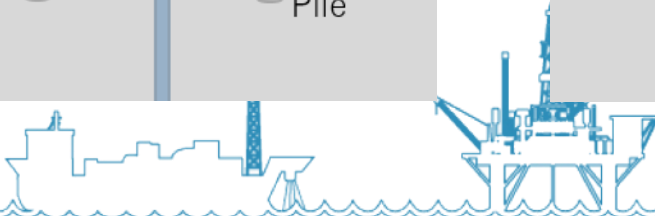
Using the abandoned HT wells' heat to generate electricity.  
Reducing cost of plugging the abandoned wells and reuse them.

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2. Wind power/Ocean current power generation to supply offshore oil& gas production facilities (renewable energy)

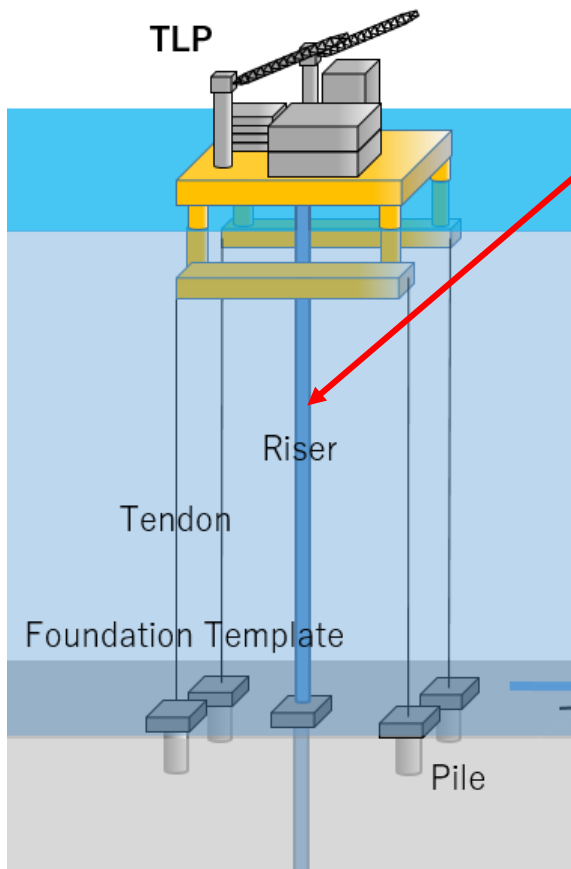


As much as possible, wind turbine supply electricity, and 50% capacity factor is expected.



# Themes for next Program

3. Cost reduction technology for flammable gas removal and re-injection at production facilities (global warming)



Oil/ Water/ Methane/CO<sub>2</sub>/ H<sub>2</sub>S



Now:

Still some facilities flaring methane and release CO<sub>2</sub>



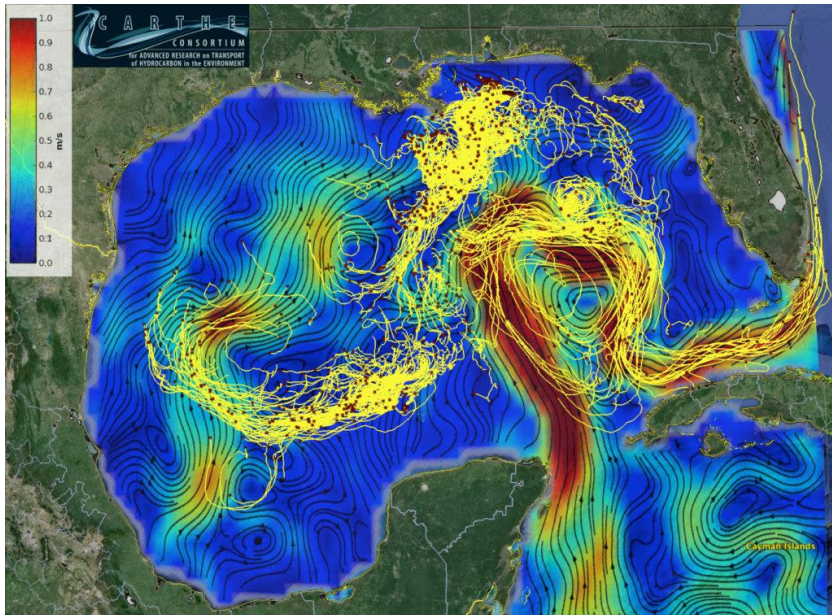
Future:

Capturing all methane and CO<sub>2</sub>, then inject into the reservoirs



# Themes for next Program

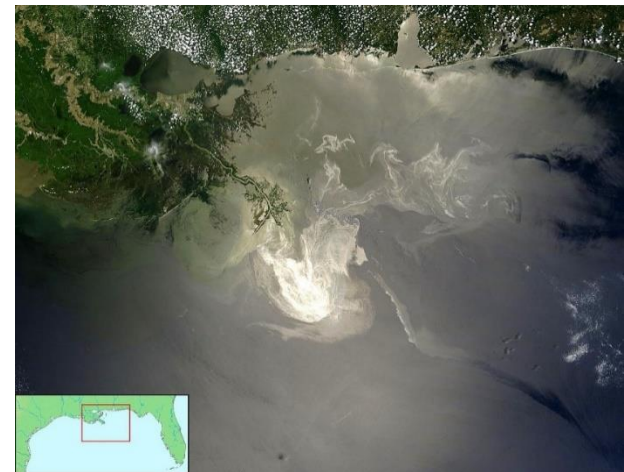
- Establishment of oil spill drift forecast simulation method by using local ocean current monitoring by aerial drone (marine environment)



The currents of the GOM are complex and change from moment to moment



Continuous monitoring of ocean currents by drone

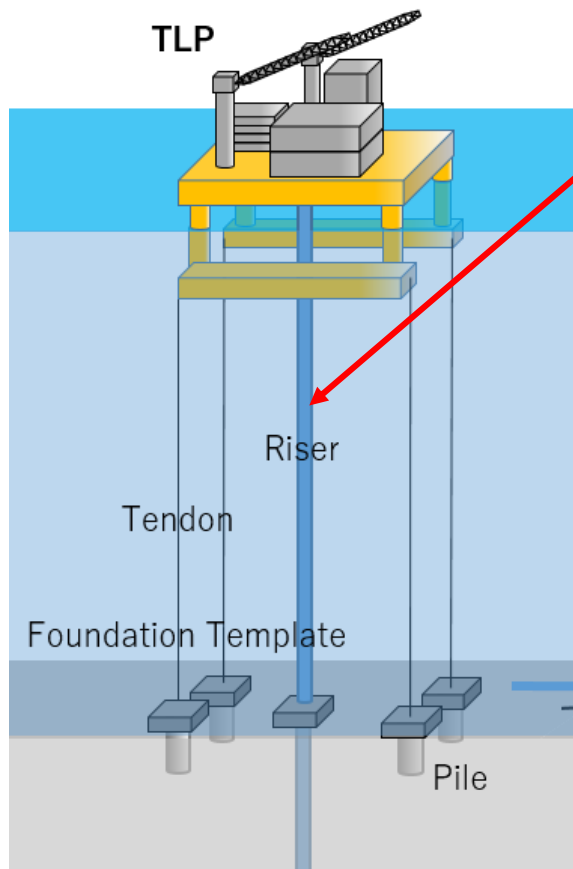


Enables effective oil spill response by improving simulation accuracy



# Themes for next Program

## 5. Hydrogen related technologies (global warming)



Oil/ Water/ Methane/CO<sub>2</sub>/ H<sub>2</sub>S



Now:

Still some facilities flaring methane and release CO<sub>2</sub>



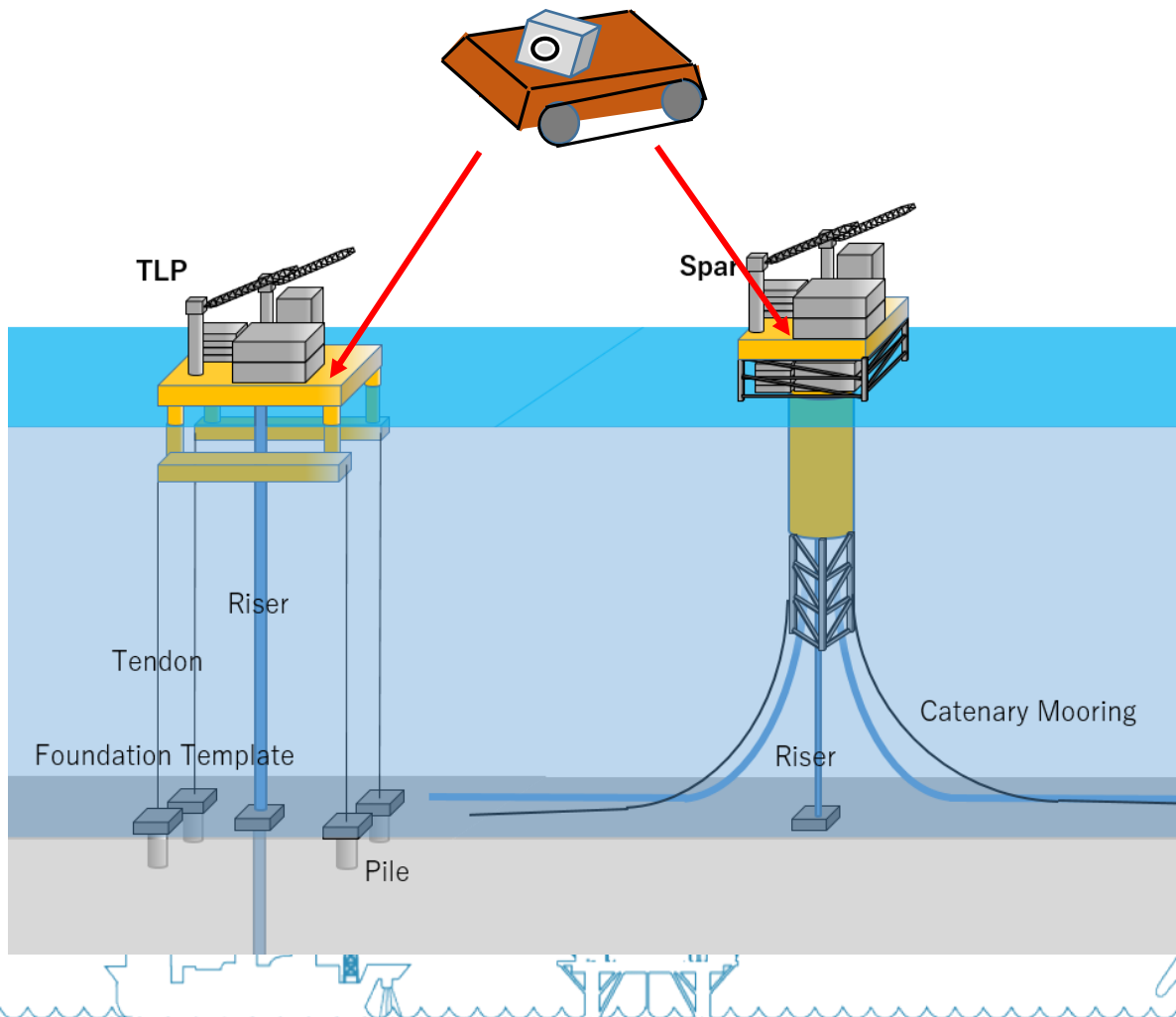
Future:

Reforming Methane into Hydrogen and CO<sub>2</sub>, then utilize Hydrogen and inject CO<sub>2</sub> into the reservoirs



# Themes for next Program

- Safety related techs including NUF (normally unattended facilities) and robotics (the safety of the working environment )



Even in environments where explosive gases are generated, periodical inspections are conducted by operators

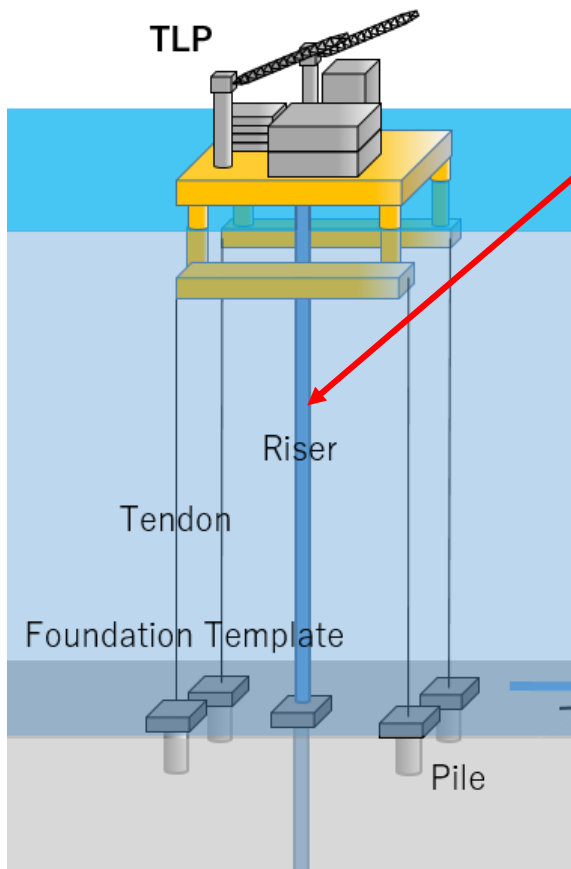


Place an explosion-proof robot to minimize the burden on operators and contribute to ensuring safety



# Themes for next Program

## 7. Water treatment related technologies (marine environment)



Associated water from Oil & Gas Field



Utilizing filtration device, then make associated water very clean

