



Solutions.
People.
Energy.SM



Integrated Artificial Lift Excellence: Technologies, Operations, and the Digital Future

12 – 13 May 2026 | KUALA LUMPUR, MALAYSIA



Solutions.
People.
Energy.™

Integrated Artificial Lift Excellence:
Technologies, Operations, and the Digital Future



Advanced Artificial Lift Technology Integration for Sustainable Field Development

Dicky Alviansyah
Baker Hughes



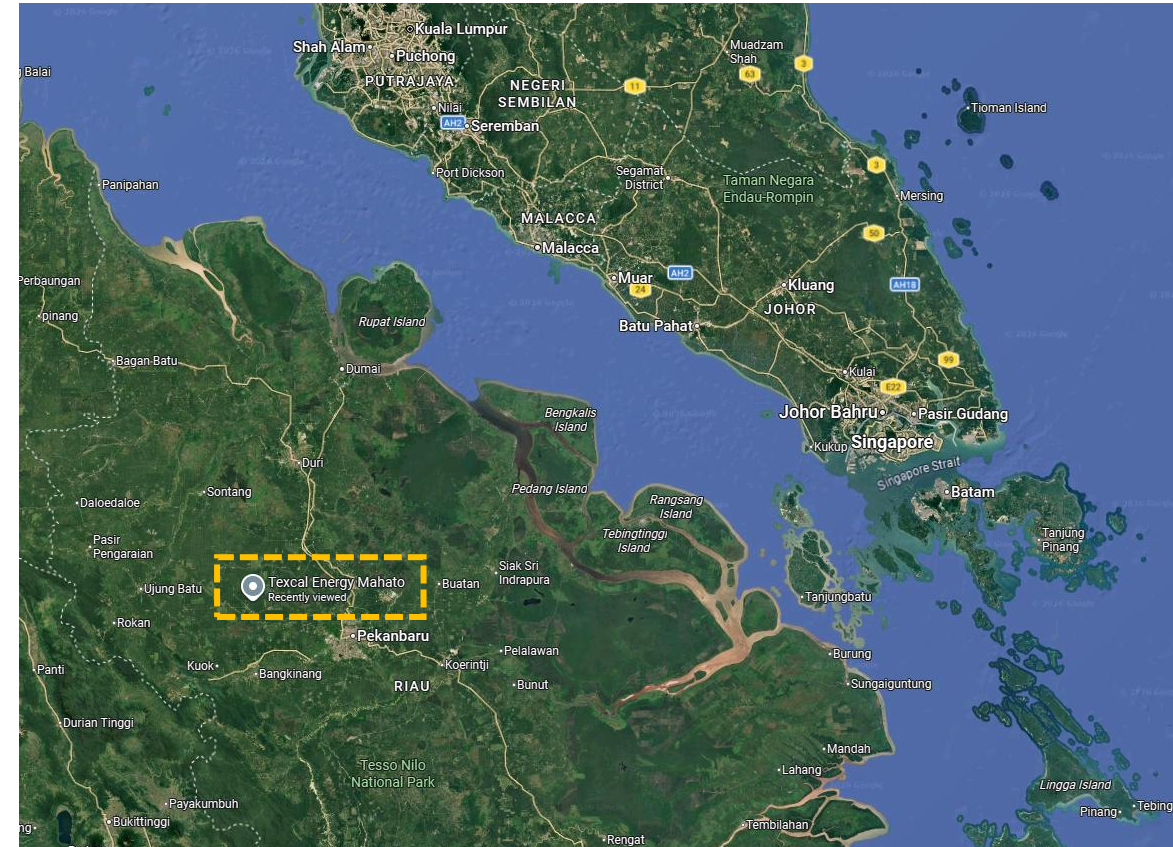


Solutions.
People.
Energy.™



Introduction

- The growing demand for energy drives increasing oil exploration activities, significantly boosting the adoption of ESP.
- More advanced ESP systems are developed to address the ever-evolving problems as challenges get more complex.
- Integration of technology in ESP system provides more reliable and advanced solutions for sustainable field development.
- In a Sumatera field, continuous ESP operation powered by diesel generator costs USD7.5 million annually.
- Three newly-drilled wells in Sumatera onshore field were planned for increasing the oil production and saving power simultaneously.





Solutions.
People.
Energy.™



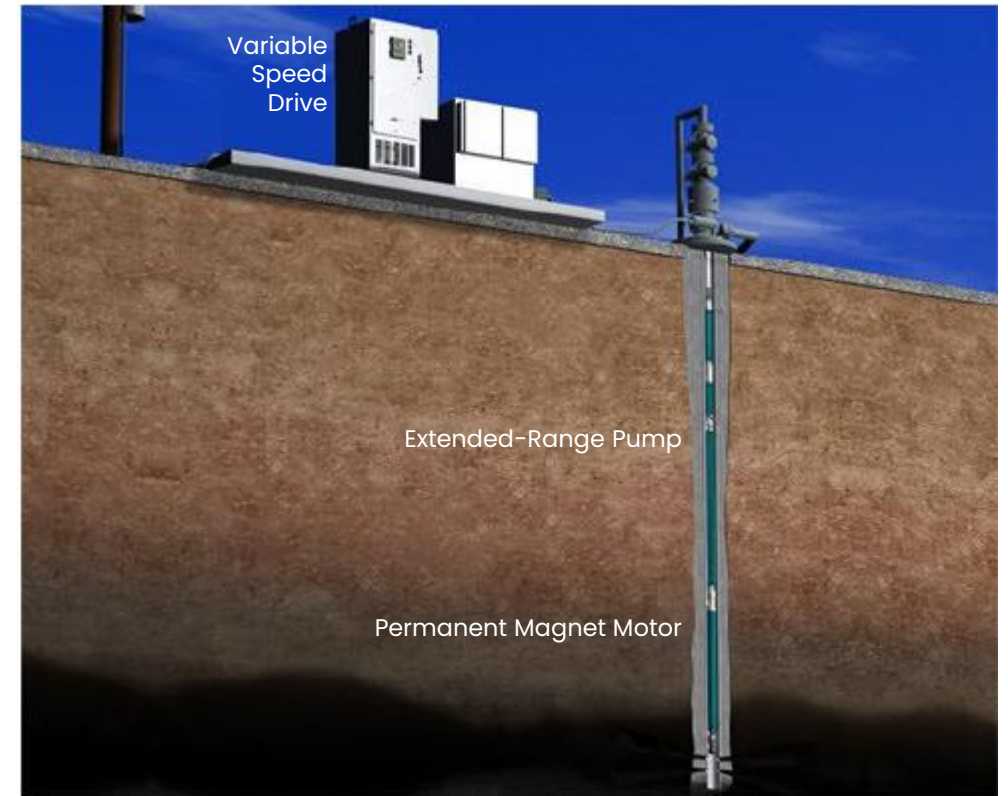
Challenges and Integrated Solution

CHALLENGES

- Uncertain reservoir performance
- Sand production issue, resulting in infant failures/downhole problem
- High power consumption conventional ESP systems
- Limited electricity from diesel generators

INTEGRATED SOLUTION

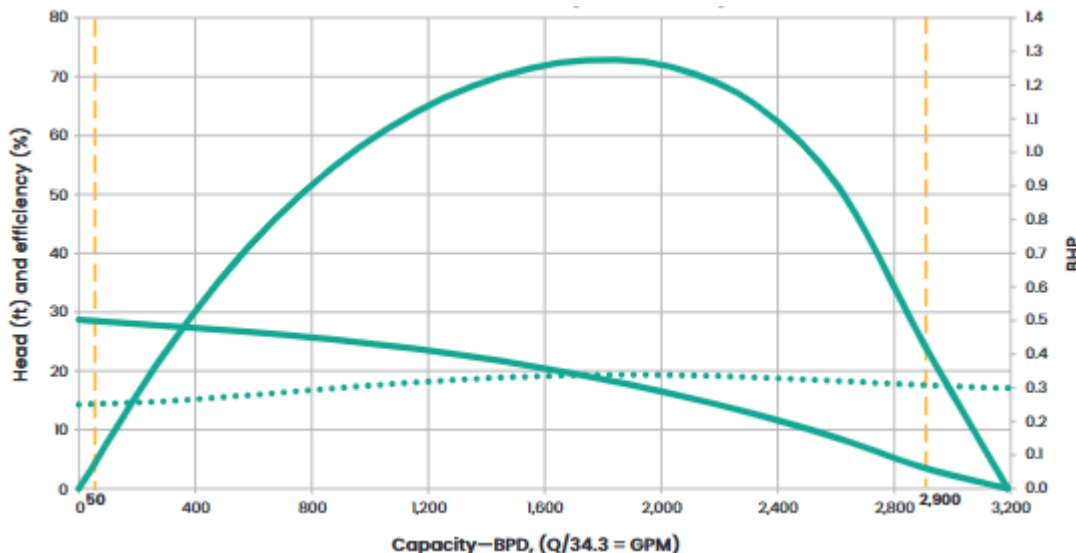
- Extended-Range Pump Application with Abrasive Resistance
- High Efficiency Permanent Magnet Motor
- Variable Speed Drive



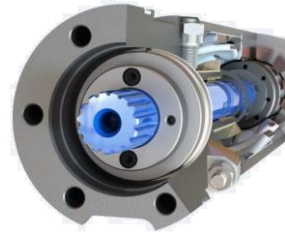
Technology Overview

Extended-Range (ER) Pump

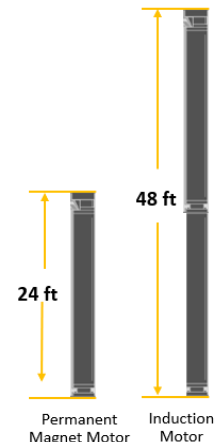
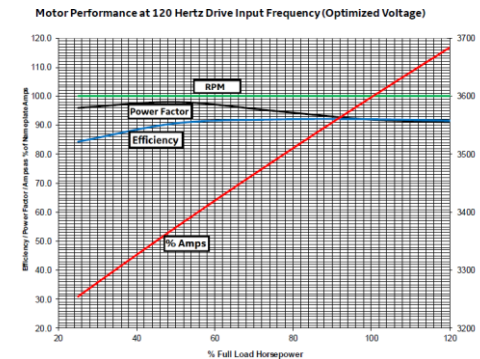
- Flow range 50 – 2,900 BFPD at 60hz
- Mixed flow stage geometry
- Abrasive resistance (1:1 or 1:4)
- BEP Efficiency 74%, BEP Head 19.5 ft
- Floating construction



Permanent Magnet Motor (PMM)



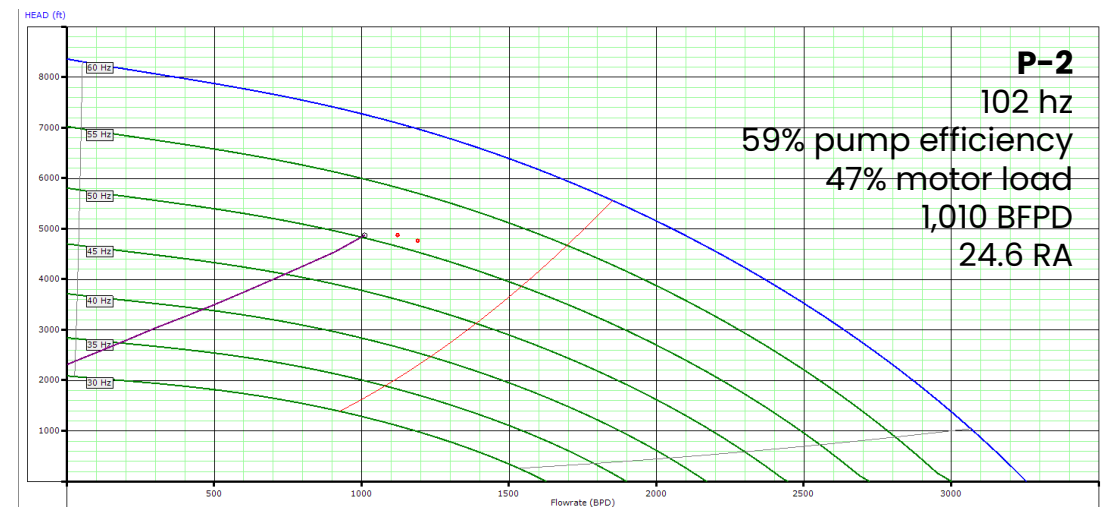
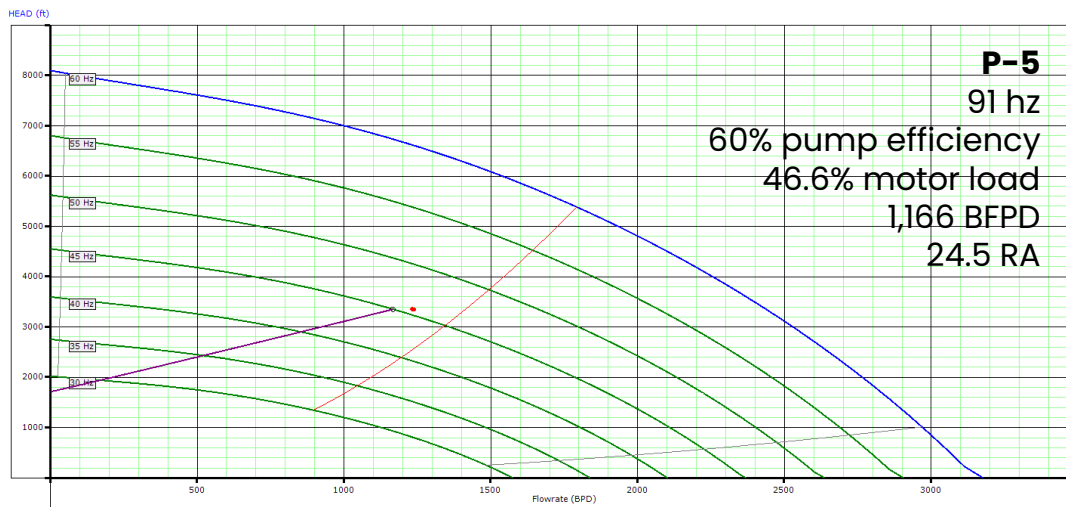
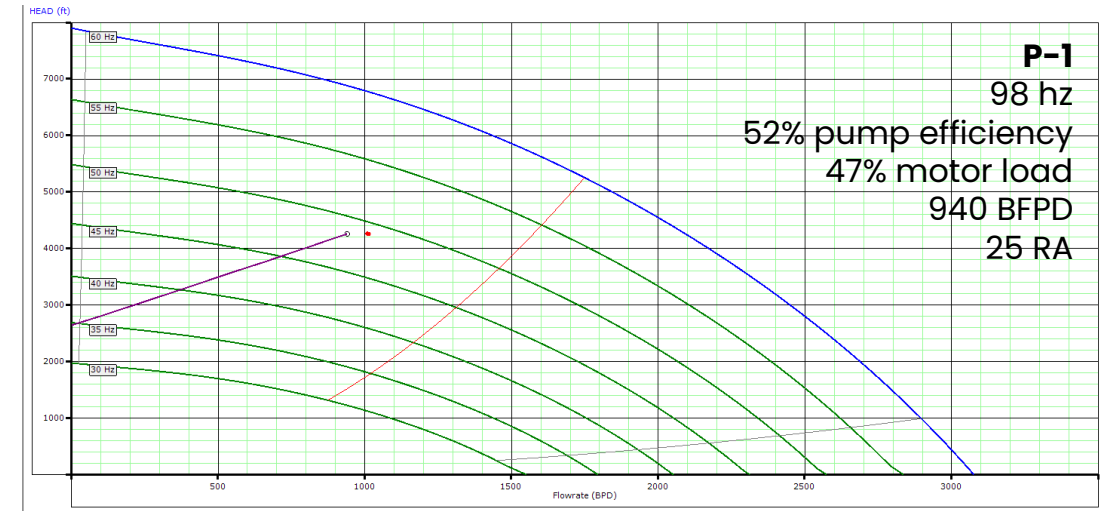
- Eliminates induction losses
 - Reduces system power consumption by 20%
 - Lowers idle amps
- Higher power density
 - Has shorter length for the same HP rating
 - Removes the need for tandem motor
 - Maintains optimal power factor and efficiency across entire load range
- Higher power factor
 - Reduces power system size requirements
 - Reduces cable power losses by 25%





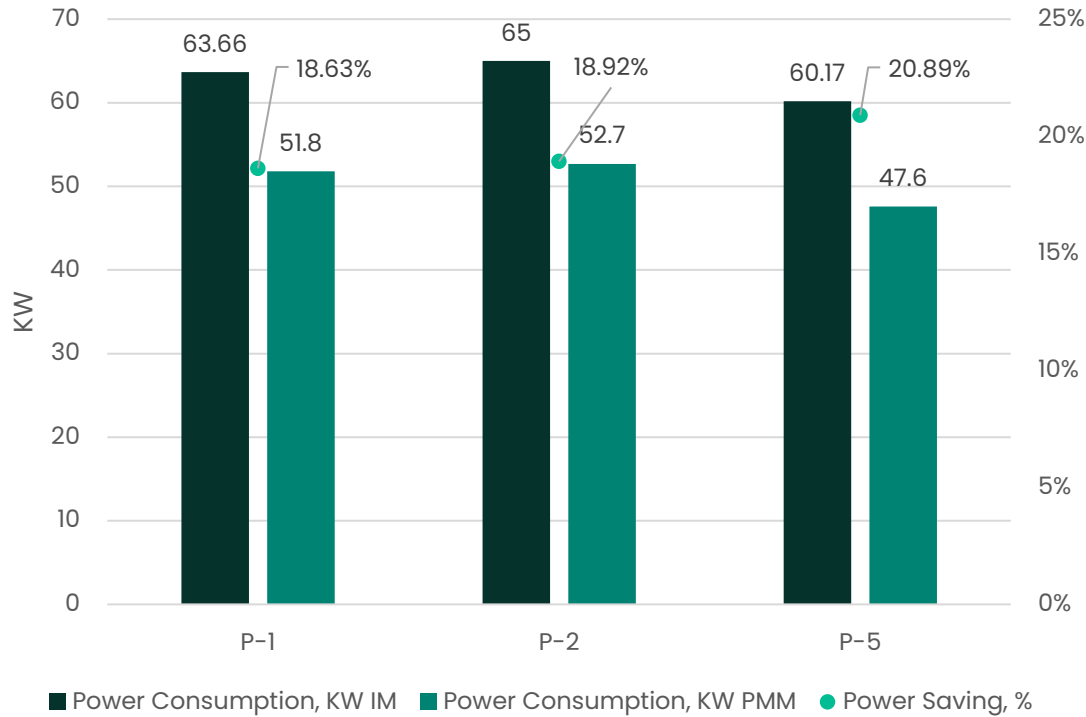
Results and Discussion

Parameter	P-1	P-2	P-5
Oil API	33.1	33.1	33.1
Prod GOR, scf/stb	62	62	62
WC, %	63	1.16	86
PSD, ft MD	5,640	5,815	6,500
Target rate, BFPD	1,000	1,000	1,000
Static pressure, psi	1,151	1,147	1,568
Tubing pressure, psi	100	100	100

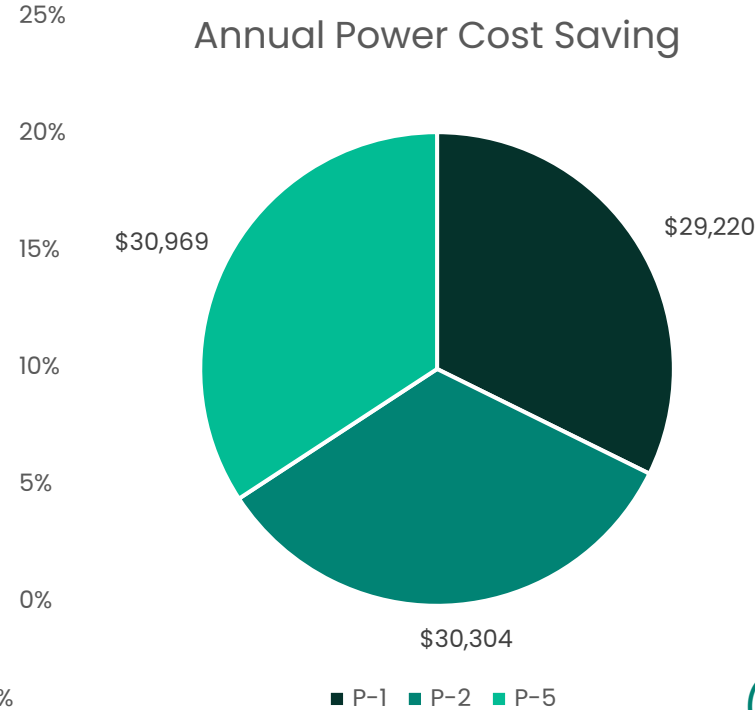




Results and Discussion (Cont'd)



Annual Power Cost Saving



Total annual power cost saving is USD 90,000 (189 kW IM vs 152 kW PMM)

19,6% average power saving (37 kW reduction = 208 tons of carbon emission annually).

Well	BFPD	BOPD	Power Consumption, KW		Power Saving, %	Annual power cost saving, USD
			IM	PMM		
P-1	940	347	63.66	51.8	18.63%	\$ 29,220
P-2	1010	998	65	52.7	18.92%	\$ 30,304
P-5	1166	163	60.17	47.6	20.89%	\$ 30,969



Results and Discussion (Cont'd)

- Extended range of pump's ROR allows more flexible operation, preventing stage wear issue which can lead to failure and costly well interventions and loss production at the same time.
- The opportunity cost of power saving can be strategically allocated to unlock more wells without requiring additional power demand.
- If assumed the similar power saving expectation, the operator can expect to unlock one more oil well for every four PMM wells as the adoption is growing.
- The unlocked well can potentially generate daily revenue up to USD 30,000.



Solutions.
People.
Energy.™



Conclusion

- Integrated artificial lift solutions to address growing challenges in oil production.
- This work demonstrates the integrated deployment of extended range ESP powered by high efficiency PMM controlled by Variable Speed Drive in the Sumatera onshore field to address complex challenges.
- Deployed across three wells, resulting in USD 90,000 of power cost saving annually because of power consumption reduction (189 KW to 152 KW)
- The solution is highly replicable and scalable for developing fields with power constraints, either targeting the power cost saving or seeking new opportunity for incremental oil recovery.



Solutions.
People.
Energy.™

Integrated Artificial Lift Excellence: Technologies, Operations, and the Digital Future



THANK YOU

