



# **CERES AND DOOSAN EXPAND STRATEGIC COLLABORATION**

19 October 2020

**CLEAN ENERGY STARTS WITH CERES**



# Strategic rationale

- Doosan Fuel Cell, the world's stationary power fuel cell market leader, acquires a non-exclusive licence to manufacture Ceres solid oxide fuel SteelCell® stacks
- Doosan plans to build a manufacturing facility in South Korea with an initial 50MW capacity anticipated by 2024, in collaboration with Ceres
- Ceres to support Doosan in the development of systems for higher power utility scale applications, in line with Ceres strategic plan
- Doosan is the leading player in key South Korean market with over 377MW installed to date and world's largest 50MW hydrogen power plant just completed



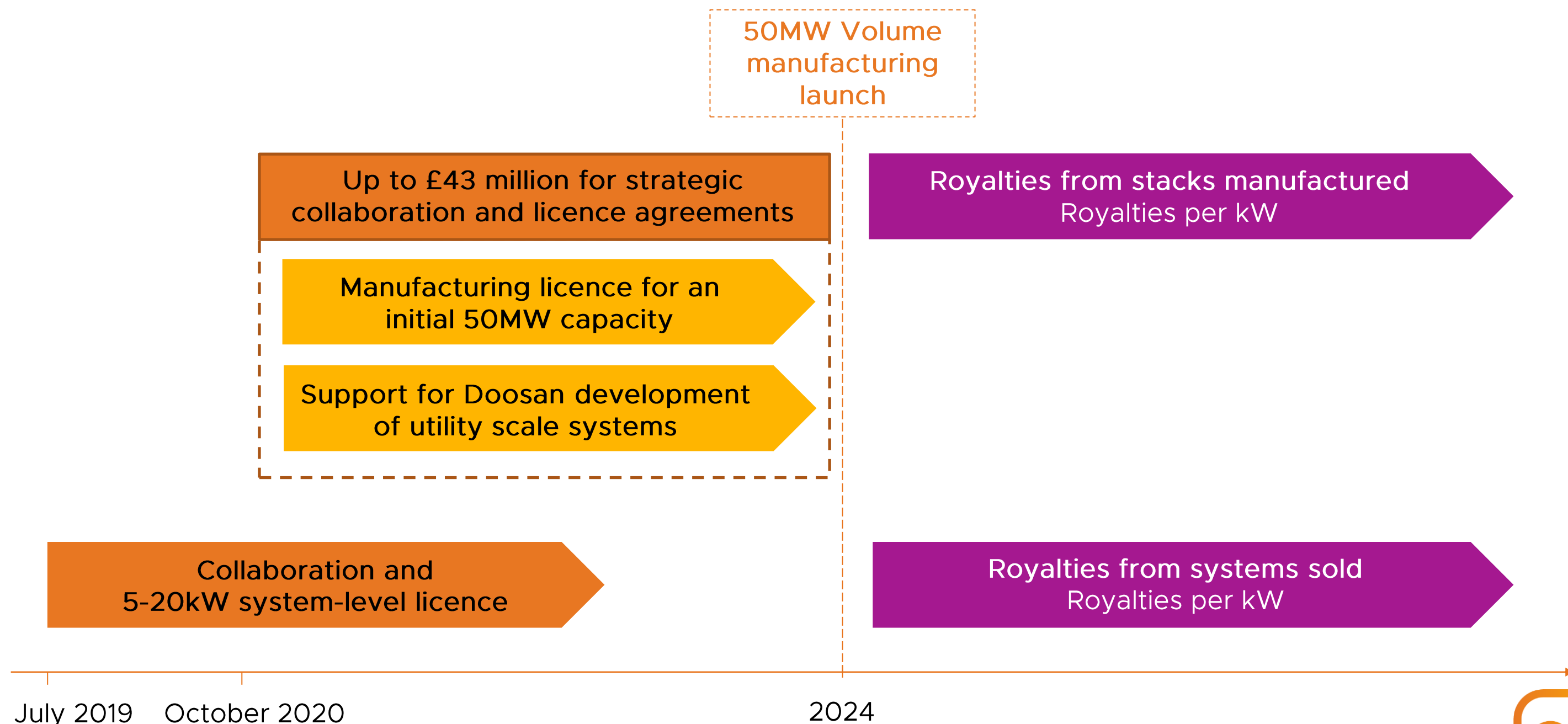
# Financial terms of the deal

- Ceres, Doosan Fuel Cell Co., Ltd. and Doosan Corporation sign strategic collaboration and licence agreements
- Total deal value of up to £43 million with licence fee, technology transfer and joint development revenues of £36 million over three years plus additional £7 million contingent on meeting KPIs
- Additional contracted royalty streams follow the production launch and commercial sale of 5kW SteelCell® stacks
- Builds upon the initial two-year collaboration and licensing agreement signed with Doosan in July 2019 to develop 5-20kW power systems, worth £8 million to Ceres

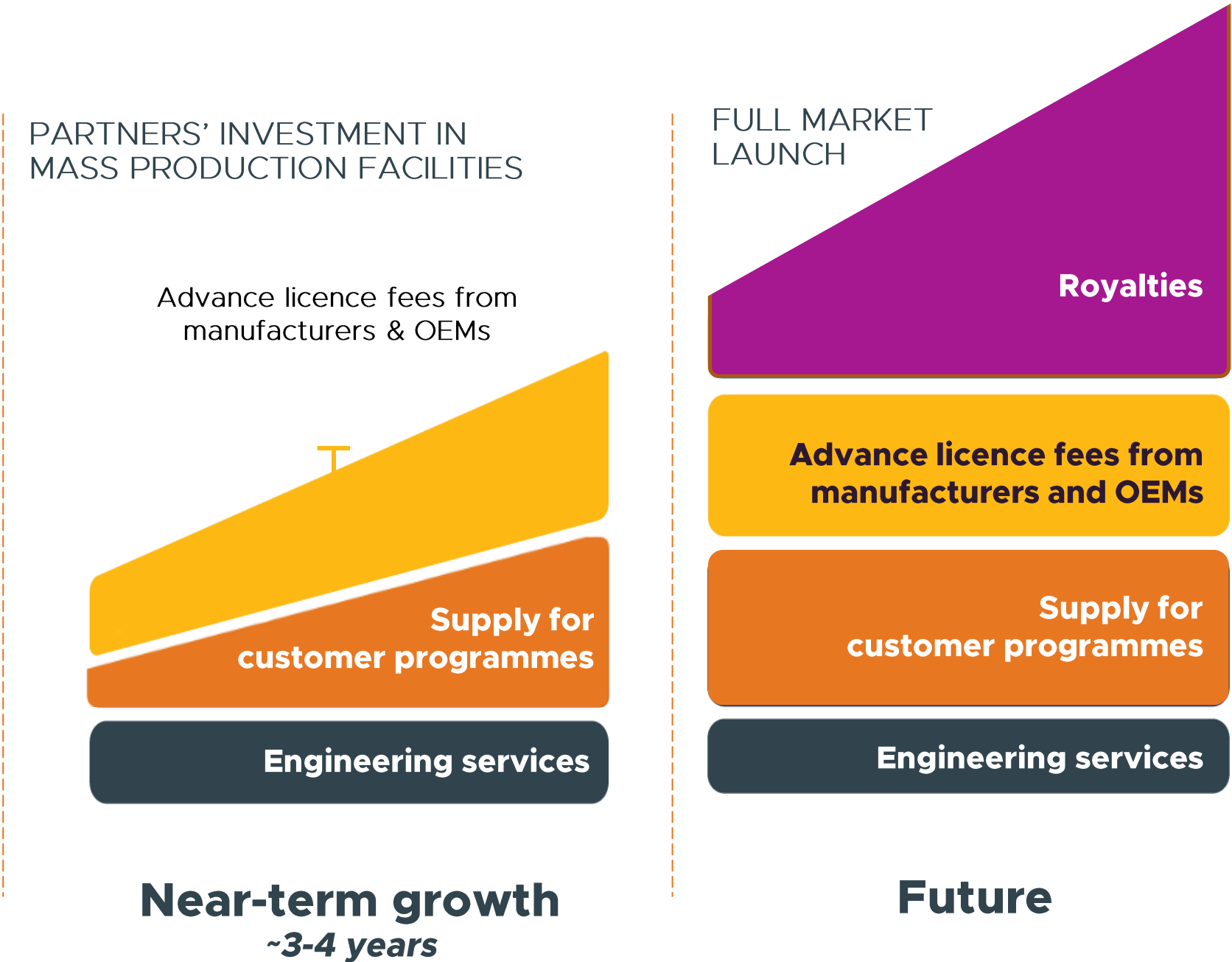
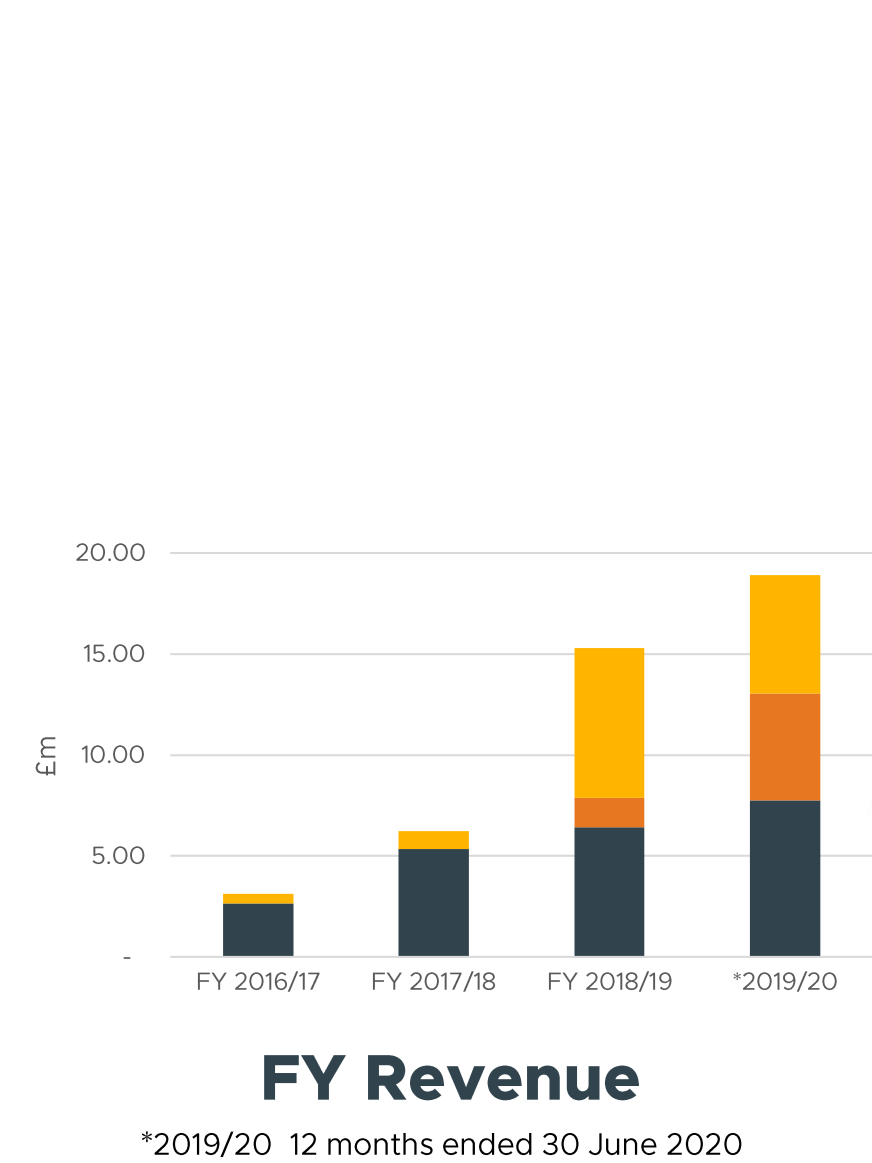




# Deepening engagement with a key partner

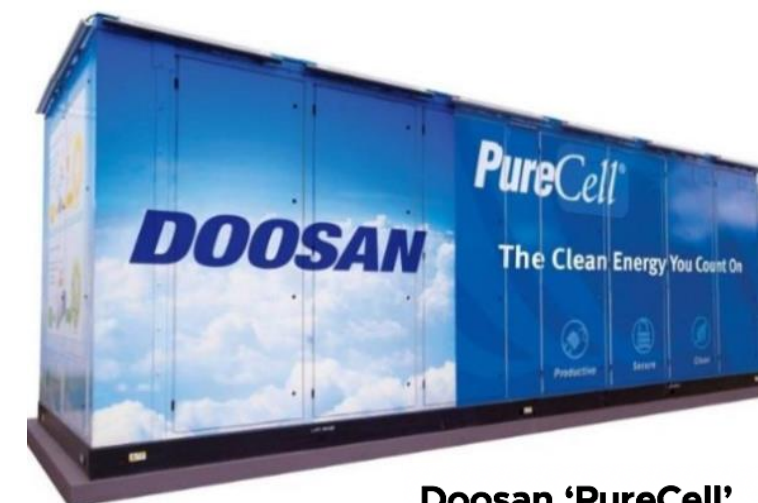


# Revenue evolution



# Doosan Fuel Cell's presence and scale

- World leader in stationary fuel cell market, spun out of Doosan Corporation as a listed entity in October 2019, currently capitalised at KRW2.95 trillion (~£1.85 billion)
- Fuel cell market leader (70% share) in South Korea, the world's largest commercial fuel cell market
- Broadening its fuel cell technologies to include solid oxide fuel cells for increased electrical efficiency targeting 60% vs PAFC of 43%
- Significant growth profile – planning to achieve revenues of KRW452 billion (£283 million) in FY2020 and KRW1.5 trillion (£940 million) in revenues by 2023\*
- Utility scale power applications including inauguration of world's first pure hydrogen-based 50MW fuel cell power plant at Daesan



**Doosan 'PureCell'**

- ❖ PAFC 440kW CHP system
- ❖ Efficiency: 90% total (43% Electric)
- ❖ Fuel Models: NG, H2, & LPG/NG Dual



# South Korea: A key hydrogen fuel cell market

- South Korea benefits from progressive regulation and incentives that encourage the deployment of hydrogen and fuel cell technology, targeting 16GW deployment by 2040
- 375MW of installed fuel cell power plants in South Korea accounted for 35% of global installed fuel cell capacity in July 2020
- South Korea's Green New Deal has committed KRW73.4 trillion (£46 billion) by 2025 as part of a wider national strategy to:
  - transform the economy from being carbon-dependent
  - support industry and jobs
  - tackle climate change challenges
- Initiative to convert three cities to become hydrogen-powered, with funded projects including green hydrogen production schemes, fuelling infrastructure for fuel cell vehicles and combined heat and power systems for the built environment



# Fuel cells – Korea's New Growth Industry

- **Renewable Portfolio Standard (RPS) System**

- Public utilities and IPPs, must source at least 7% of total power production from new/renewable sources in 2020, a figure which rises by 1% each year up to 10% in 2023
- Fuel cell installations incentivised by counting as 2x #MW in Renewable Energy Certificates

- **Hydrogen Economy Roadmap & Green New Deal (GND)**

- Korea transitioning to a hydrogen reliant economy by 2040, hydrogen market to double to KRW26.8 trillion (£17.3 billion) by 2030
- GND: KRW20 trillion (£13 billion) allocated towards greener energy, mobility & infrastructure
- FCEVs: 79,000 units by 2022, 5.9 million units by 2040

Application	Type	2018	Transition	2022	Transition	2040
Power Generation	FC Power Plants	307MW	Installation cost down to KRW 3.6mn (£2,300)/kW	1.5GW	Same generation cost as GTPP	15GW
	Residential FC	7MW	Installation cost down to KRW 15.3mn (£9,900)/kW	50MW	Installation cost down to KRW 7.1mn (£4,600)/kW	2.1GW

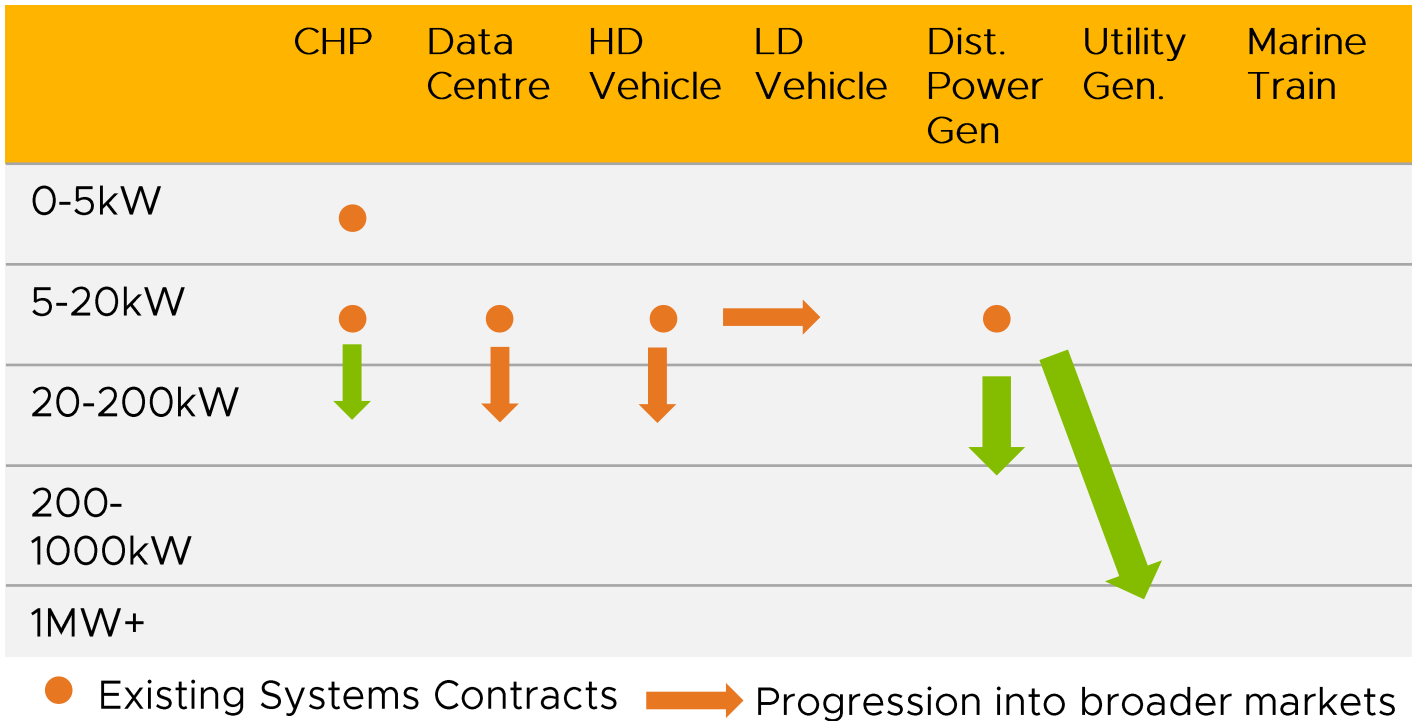


# Future scaling of the business

Target global manufacturing partners to supply cells and stacks to system OEMs in regions of greatest demand



Moving into higher power systems and broadening applications in each region (through system licensees)



# Summary

- A strategic deal worth up to £43 million to Ceres over the next three years
- Key manufacturing partner in world's largest market for stationary power fuel cells
- Doosan plans to build a manufacturing facility in Korea with an initial 50MW capacity anticipated by 2024, in collaboration with Ceres
- Ceres and Doosan to develop power systems to target utility scale applications, in line with Ceres strategic plan to expand into higher power
- Royalty revenue steams anticipated after mass manufacturing launch in 2024





# QUESTIONS







# THANK YOU

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