CF Commitment to Clean Energy Economy

Clean Fuels for a Sustainable World

October 29, 2020

NYSE: CF

Safe harbor statement

All statements in this communication, other than those relating to historical facts, are forward-looking statements, including, but not limited to, statements as to strategic plans and management's expectations with respect to the production of green and low-carbon ammonia, the development of carbon capture and sequestration projects, the transition to and growth of a hydrogen economy, greenhouse gas reduction targets, projected capital expenditures, and other items described in this communication. Forward-looking statements can generally be identified by their use of terms such as "anticipate," "believe," "could," "estimate," "expect," "intend," "may," "plan," "predict," "project," "will" or "would" and similar terms and phrases, including references to assumptions. Forward-looking statements are not guarantees of future performance and are subject to a number of assumptions, risks and uncertainties, many of which are beyond our control, which could cause actual results to differ materially from such statements. Important factors that could cause actual results to differ materially from our expectations include, but are not limited to, the failure of cost competitive global renewable energy capacity to increase significantly; realization of technological improvements required to increase the efficiency and lower the costs of production of green and low-carbon ammonia; development and growth of end market demand and applications for low-carbon hydrogen and ammonia; government regulation, incentives, and initiatives; cost overruns; performance of third parties; permitting matters; and other unforeseen difficulties. Important factors that could cause actual results more generally to differ materially from our expectations are discussed in our filings with the Securities and Exchange Commission, including our most recent annual and quarterly reports on Form 10-K and Form 10-Q, which are available in the Investor Relations section of the CF Industries web site.

It is not possible to predict or identify all risks and uncertainties that might affect the accuracy of our forward-looking statements and, consequently, our descriptions of such risks and uncertainties should not be considered exhaustive. There is no guarantee that any of the events, plans or goals anticipated by these forward-looking statements will occur, and if any of the events do occur, there is no guarantee what effect they will have on our business, results of operations, cash flows, financial condition and future prospects. Forward-looking statements are given only as of the date of this communication and the company disclaims any obligation to update or revise the forward-looking statements, whether as a result of new information, future events or otherwise, except as required by law.

Executive summary: commitment to clean energy economy

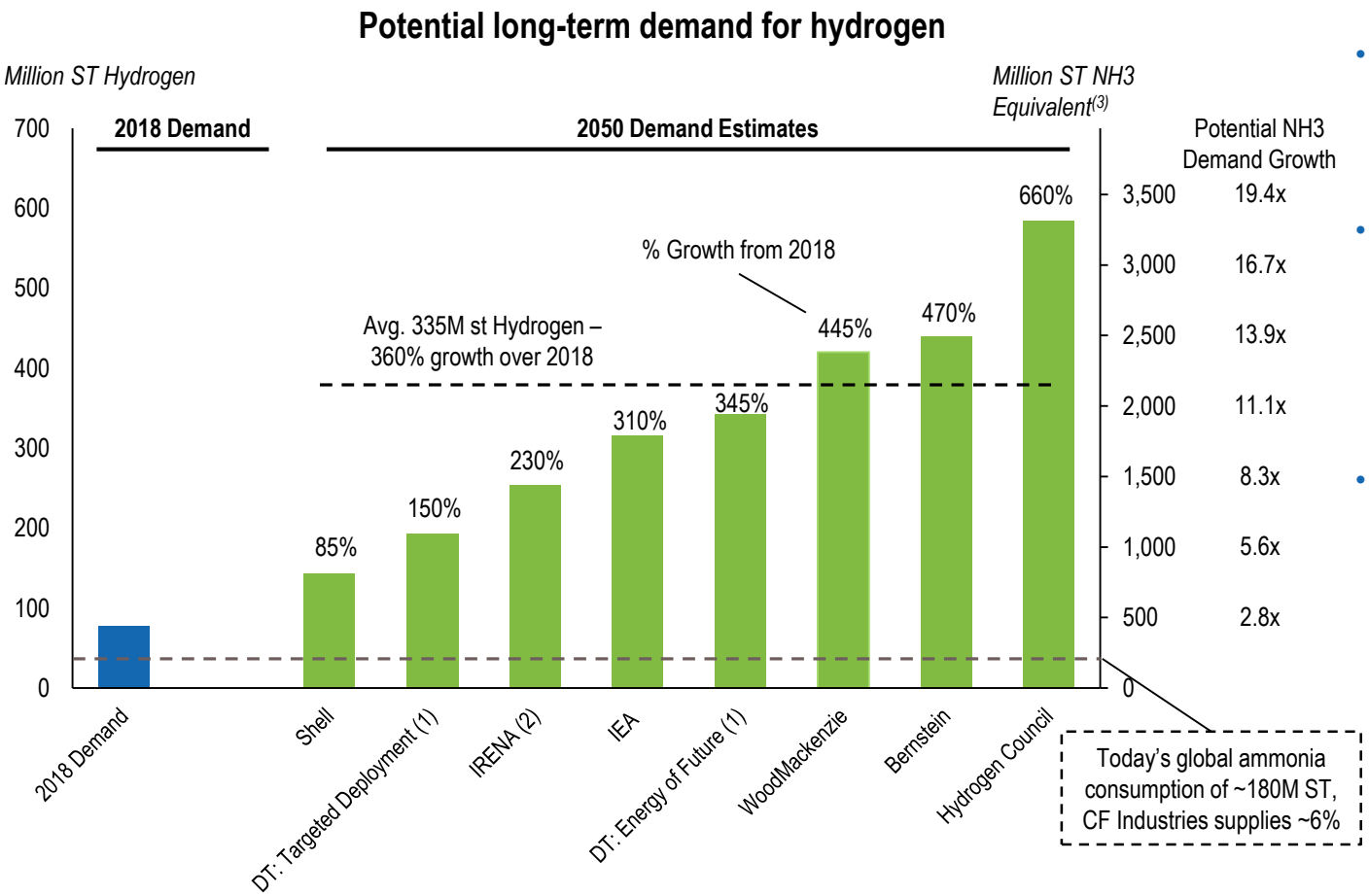
- Hydrogen has emerged as a leading clean energy source to help the world achieve net-zero carbon emissions by 2050
- Ammonia is one of the most efficient ways to transport and store hydrogen and is also a fuel in its own right
- CF is the world's largest producer of ammonia and is uniquely positioned, with an unparalleled asset base and technical knowledge, to serve this anticipated demand
- Company is announcing commitment to decarbonize the world's largest ammonia production network, positioning CF at forefront of clean hydrogen supply
- New green ammonia project announced at Donaldsonville Nitrogen Complex today expected to fit within normal $400-450 million annual capex budget
- Establishing carbon emissions reduction targets of:
  - 25% reduction by 2030
  - net-zero carbon emissions by 2050
- Clear pathways to growth in clean energy:
  - Green ammonia production - ammonia produced through a carbon-free electrolysis process using renewable electricity
    - Renewable electricity accounts for approximately 25% of CF's total system consumption
  - Low-carbon ammonia - ammonia produced by conventional processes but with CO_2 removed through carbon capture and sequestration (CCS) and other certified carbon abatement projects
- Board has established a new Environmental Sustainability and Community Committee and is aligning executive compensation directly to ESG objectives

Investment thesis: low-carbon ammonia

- The global focus on climate change and GHG emissions has created a push to decarbonize economies. To accomplish this, the world needs a clean energy/fuel source
  - Renewable energy (solar and wind) are growing rapidly, supported by governmental incentives
  - However, renewable energy is not consistently available and somewhat unpredictable creating the need to have a clean energy source that can be stored and transported
- Hydrogen has emerged as a clean energy source
  - Hydrogen can be produced with zero carbon emissions through the electrolysis of water, using renewable energy
  - However, hydrogen is difficult to store and transport given its combustible nature and extremely low boiling point temperature (-423 F)
- Ammonia (NH3) has a much higher boiling point (-28 F), is an efficient storage and transport medium for hydrogen
  - Significantly higher energy density than hydrogen and considerably more efficient than lithium ion batteries
  - Infrastructure to store and transport ammonia already exists with a presence in 120 seaports globally and seaborne trade of ~20 million tons annually
  - Ammonia can be used directly as a fuel, in addition to serving as a storage and transport medium for hydrogen
- The solution: produce low-carbon ammonia for use as a fuel and a hydrogen storage and transportation medium to assist decarbonizing economies
  - Green ammonia is produced through electrolysis of water to produce carbon free hydrogen and synthesis to ammonia
  - Low-carbon ammonia can be produced by either carbon capture and sequestration where process-gas CO2 is removed and injected into geological storage, or through utilizing certified carbon abatement credits to offset produced CO2

The result: exponential growth in low-carbon ammonia

Hydrogen demand projected to grow exponentially



- Hydrogen has emerged as a leading clean energy source to achieve global GHG emission reductions and energy stability
- Development of the clean energy economy is expected to receive significant levels of investment by governments, global organizations, and private industry
- Global ammonia demand will increase substantially over the current annual demand of ~180M ST if only a portion of the growth in hydrogen demand is supported by low-carbon ammonia

Source: IEA, Wood Mackenzie, Bernstein: Hydrogen Highway 2020: Ready for Prime Time Deloitte: Australian and Global Hydrogen Demand Growth Scenario Analysis, prepared for COAG Energy Council – National Hydrogen Strategy Taskforce, November 2019

(1) Deloitte (DT) Scenarios: Energy of the Future –Hydrogen demand where all aspects of industry development are favorable for Hydrogen; Targeted Deployment – Countries adopt a targeted approach which aims to maximize economic value in the development of Hydrogen; (2) IRENA is the International Renewable Energy Agency; (3) Each st of ammonia contains 17.65% hydrogen by mass. 5.67 st of ammonia are required for each st of hydrogen

Low-carbon ammonia: the key enabler for clean hydrogen energy

Ammonia is the solution for storage & transportation

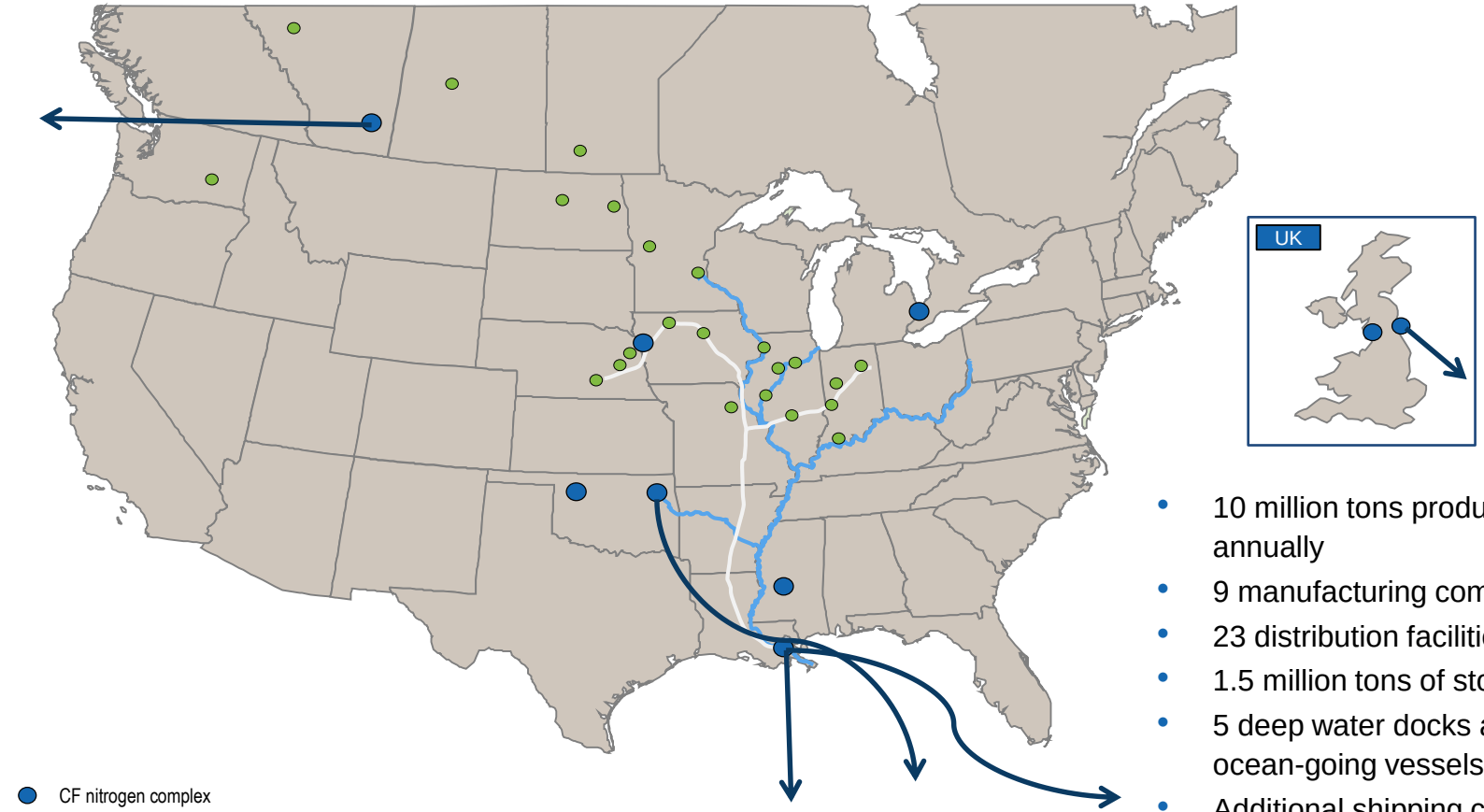
- 180 million tons of ammonia safely produced, stored, transported and consumed globally
- Ammonia's energy density is ~1.5x that of liquid hydrogen, ~3.0x that of gaseous hydrogen, and ~14.0x that of lithium ion batteries, allowing for more economic transport and storage of energy
- Global ammonia transportation and storage infrastructure already exists with a presence in 120 seaports globally
- Ammonia disassociation to create pure hydrogen is a mature technology
- Ammonia can be used directly as a fuel in addition to a storage and transport medium for hydrogen
  - Used directly for power generation in ammonia-fired turbines, engines, marine vessels and mixed with coal in power plants

Source: The Royal Society

CF has the leading asset base

Ideally positioned to lead hydrogen economy by leveraging existing network

CF has the world's largest and most integrated ammonia production and distribution network



- 10 million tons produced annually
- 9 manufacturing complexes
- 23 distribution facilities
- 1.5 million tons of storage
- 5 deep water docks able to load ocean-going vessels
- Additional shipping capacity via pipeline, barge, rail, truck

CF nitrogen complex
CF owned distribution facility
NuStar Pipeline
Ammonia Export Capability

CF has numerous initiatives underway in support of clean energy

Low-carbon Ammonia | **Green Ammonia**

Ammonia as a fuel

In discussions for supplying ammonia as marine fuel and for global power generation

Developing numerous carbon capture and sequestration (CCS) projects near CF production facilities

CO_2 sequestration

Green ammonia manufacturing

Initial investment in green ammonia electrolysis project at Donaldsonville Nitrogen Complex

Evaluating certified CO_2 abatement projects within the existing network

CO_2 abatement

Ammonia for Hydrogen storage & transport

Partnering with companies developing low-carbon end-market applications/demand

Clean Fuel: The growth platform for long-term shareholder value

- Clean energy production significantly enhances CF's long-term growth trajectory
  - Ability to achieve higher margins over time by capturing clean energy value of ammonia rather than the nutrient value of ammonia
- Projected demand for low-carbon ammonia will significantly exceed current global ammonia capacity
- To meet anticipated demand, the value for green ammonia must satisfy cost of capital hurdles to incentivize the construction of new greenfield production facilities
- CF's existing asset base provides brownfield expansion opportunities, placing CF years and billions of dollars of investment ahead of greenfield projects
  - CF green ammonia production advantages:
    - Hydrogen from electrolysis can be fed into existing ammonia synthesis unit, displacing hydrogen from steam methane reformer
    - Existing logistics infrastructure available to store and deliver green ammonia efficiently
    - Unparalleled technical expertise exists within CF network
    - ~25% of total system electricity usage already from renewable resources
  - CF blue ammonia production advantages:
    - Existing CO_2 header and collection systems
    - Several production sites near CO_2 pipelines
    - Numerous CO_2 sequestration projects under development near our sites
    - Government incentives in place with 45Q credits ($31/ton, increasing to $45/ton by 2026)