



HOPS MARKET OVERVIEW

August 2021



CAUTIONARY NOTE ON FORWARD-LOOKING STATEMENTS

This presentation contains forward-looking statements concerning our business operations, and financial performance and conditions, as well as our plans, objectives, and expectations for our business operations and financial performance and conditions that are subject to risks and uncertainties. All statements other than those of historical fact are forward-looking statements.

These types of statements typically contain words such as “aim,” “anticipate,” “assume,” “believe,” “could,” “due,” “estimate,” “expect,” “goal,” “intend,” “may,” “objective,” “plan,” “potential,” “positioned,” “predict,” “should,” “target,” “will,” “would” and other similar expressions that are predictions of or indicate future events and future trends. Forward-looking statements are based on current expectations, estimates, forecasts, and projections about our business, the industry in which we operate, and our management’s beliefs and assumptions.

These statements are not guarantees of future performance or development and involve known and unknown risks, uncertainties, and other factors that are in some cases beyond our control. All forward-looking statements are subject to risks and uncertainties that could cause actual results to differ materially from those estimated. The contents of this presentation should be considered in conjunction with the risk factors, warnings, and cautionary statements contained in the Company’s annual, quarterly, and other reports filed with the U.S. Securities and Exchange Commission. We undertake no obligation to publicly update or revise any forward-looking statement as a result of new information, future events, or otherwise, except as required by law.

22ND CENTURY AND HOPS

22nd Century is leveraging its experience with tobacco and hemp/cannabis, a close hop relative, to accelerate the development of proprietary specialty hop varieties or valuable traits.



- Large global growth market with well established hops providers and consumer brands
- Industry reliance on high-risk traditional breeding techniques ripe for disruption with new accelerated molecular breeding technologies and gene-editing tools
- Leveraging research findings from closely related hemp/cannabis plants supports the development of specialty hop varieties with:
 - Distinctive aroma, flavor, nutraceutical, and medicinal properties
 - Enhanced yield, disease resistance, and other advantageous agronomic traits
- Significant European market and new European subsidiary support geographic expansion and provide additional growth opportunities for the Company's tobacco and hemp/cannabis operations

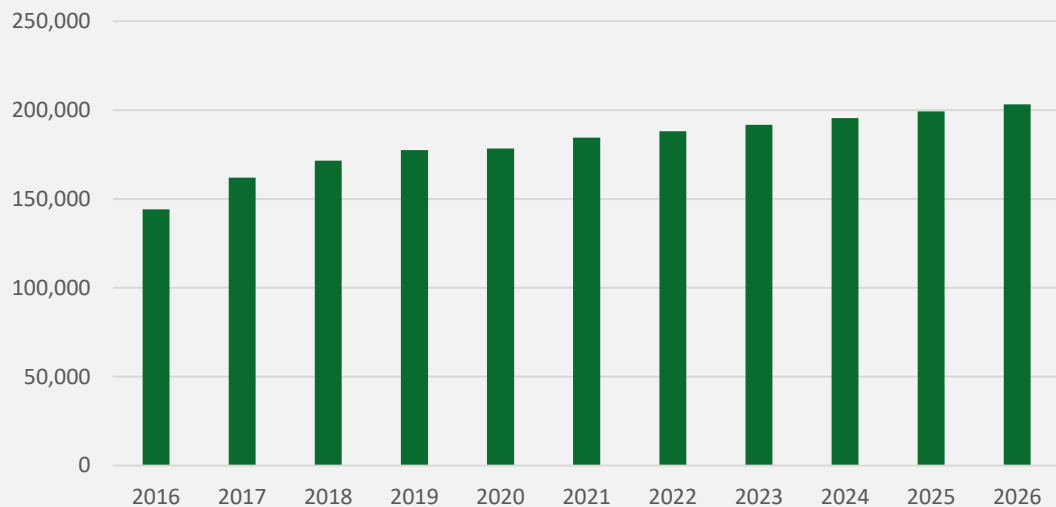
NEW GLOBAL EXPANSION OPPORTUNITIES

- Europe and the United States are home to the largest hops producers worldwide
- Establishment of a new 22nd Century subsidiary in the Netherlands facilitates commercial partnerships and collaboration with key global hops producers and customers in Europe
- The subsidiary will also be highly synergistic to support geographic expansion of the Company's tobacco and hemp/cannabis franchises into European markets



GLOBAL HOPS PRODUCTION

Global Hops Market Volume 2016 - 2026
Estimated (tons)



Germany and the United States are the largest hops growing markets worldwide

Hops Growers



Industry Leadership

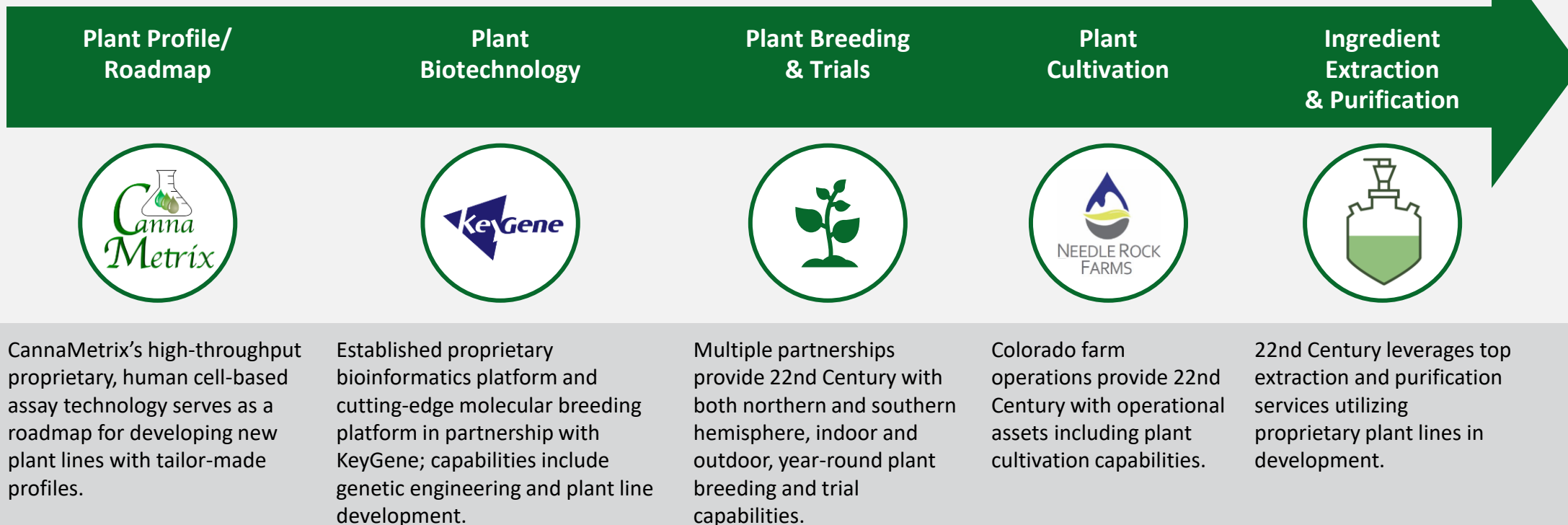


Consumer Goods and Nutraceutical Companies



ACCELERATING COMMERCIALIZATION OF NEW, DISRUPTIVE HOPS PLANTS

Strategic partnerships enable 22nd Century to deliver valuable, commercial-scale plant lines, and IP in significantly less time than the traditional 10+ years in the Hops industry



22nd Century’s innovative upstream alkaloid plant value chain is critical to unlocking new disruptive hop plant lines and IP at large-scale

22ND CENTURY'S HOPS VALUE PROPOSITION

The hops market is ripe for disruptive new plant technologies and has lower regulatory barriers than the tobacco and hemp/cannabis markets

- 1** Introduce new technologies based on molecular breeding, flowering time, and double haploid to accelerate stabilization or creation of new lines.
- 2** Introduce new agronomic traits to improve disease/pest resistance and plant architecture to increase crop yields in leading hop strains that are already well-accepted by the brewing industry.
- 3** Increase hops content of hops active molecules that drive the beer industry, such as alpha and beta acids, plus new compounds like terpenoids and flavonoids not generally associated with hops to produce new, disruptive, unique and proprietary aromatic hop flavor profiles for the brewing industry.
- 4** Increase hops content of active molecules with health and wellness applications as extracts/distillates in functional foods and beverages, nutraceuticals, and pharmaceuticals (xanthohumol and 8-prenylnaringenin).

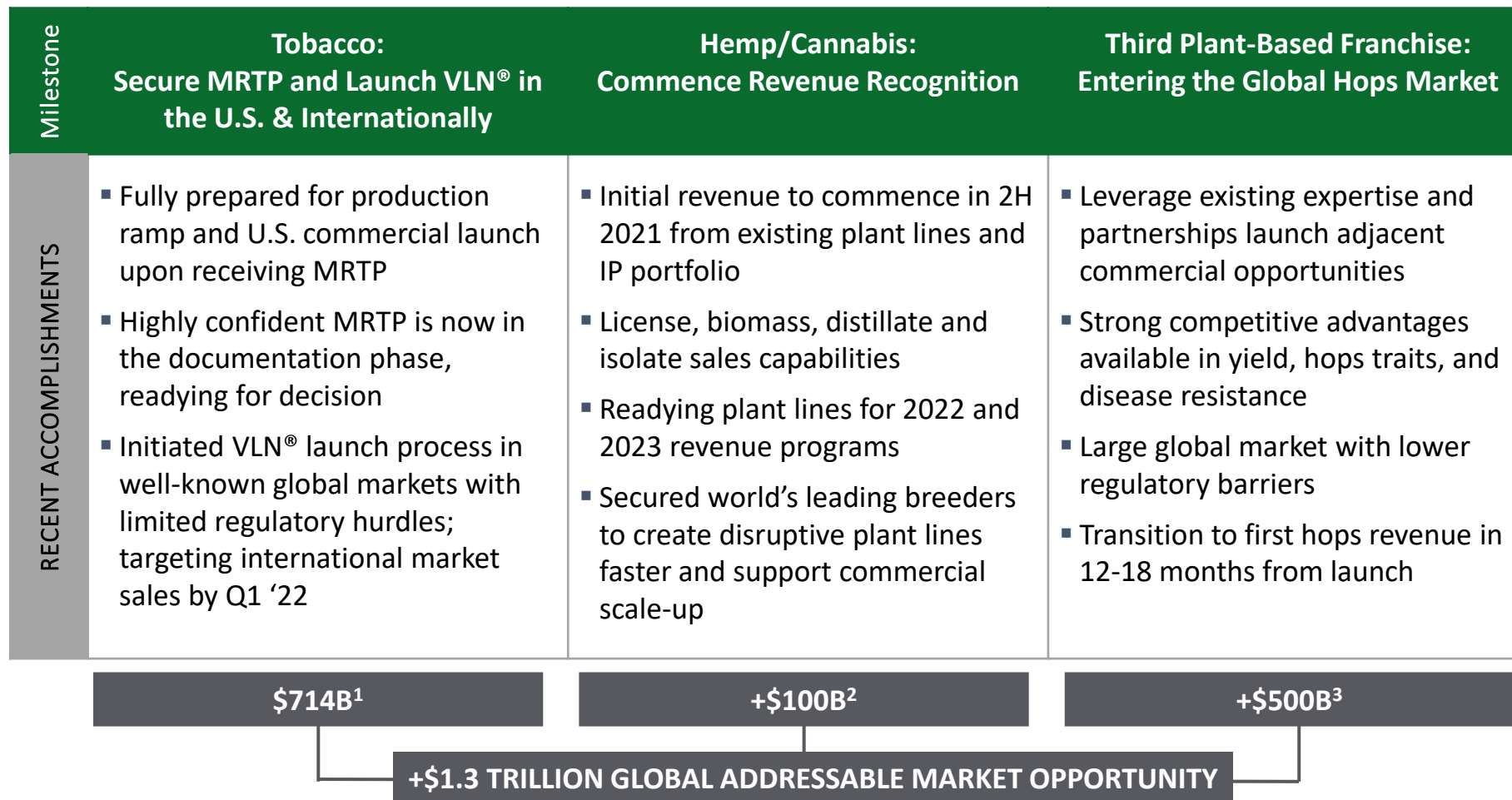
KEY INITIAL OPPORTUNITIES WITH IP AND PARTNERS

Application	Targeted Benefit
Agronomic traits/powdery mildew, downey mildew, fusarium, and wireworm (disease resistance/pest resistance)	Crop loss can be as much as 30% of the yield depending on region and year
Architecture traits/ratio cone/biomass and lupulin density	Success can generate 20-60% increase in yield
Consumer Traits/Alpha and Beta acids beer are industry drivers	Stabilize the content and tailor to meet specific requirements from brewers
Terpenoids/flavonoids (oils) new flavor drivers	This trait may have a more significant impact creating new disruptive, unique and proprietary aromatic hops flavor profiles for the brewing industry
Xanthohumol and 8-prenylningenin potential nutraceuticals and pharmaceuticals	Addressing a broad range of opportunities including managing anxiety, inducing calm, addressing sleeping disorders, resolving stomach problems, and other wellness applications

22nd Century is actively engaged in discussions with multiple hops grower and consumer product partners to develop specific desired traits.

EXPANDING THE ALKALOID OPPORTUNITY

22nd Century Group is a leading plant biotechnology and intellectual property company focused on improving health and wellness through plant science. 22nd Century uses modern plant breeding technologies, gene-editing, and molecular breeding to deliver value to its customers in the life science and consumer products industries by creating new, proprietary tobacco, hemp/cannabis and hop plants with optimized alkaloid and flavonoid profiles as well as improved yields and valuable agronomic traits.



1. Foundation for a Smoke Free World; https://www.smokefreeworld.org/wp-content/uploads/2019/08/FSFW_Global-Trends-in-Nicotine_6.22.2020.pdf 2. Prohibition Partners; "The Global Cannabis Report – November 2019"
 3. Addressable market of third plant-based franchise is based on a global estimate in 2019.

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