

22nd Century Group, Inc. (XXII - \$2.80 - Buy)

Price Target Change

Estimate Change

COMPANY NOTE

JAMES McILREE, CFA, Senior Research Analyst, +1-646-465-9034
 jmcilree@chardan.com

Sales and trading 7 a.m. to 7 p.m. ET, (646) 465-9090

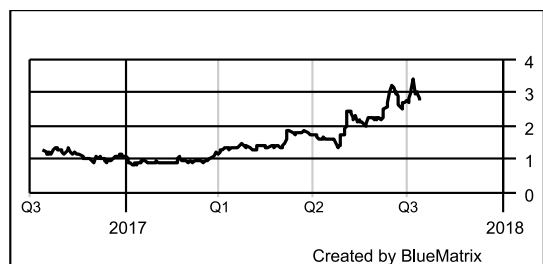
Sales and trading 7 p.m. to 7 a.m. ET, (646) 465-9063

Stock Data	10/13/17
Price	\$2.80
52 Week Range	(\$0.81 - \$3.50)
Price Target	\$11.50
Prev Price Target	\$3.50
Market Cap (mil)	\$345.52
Shares out (mil)	123.40
3-Mo Avg Vol	3,996,063
Cash per share	\$0.50
Total Debt (mil)	\$0.31

Revenues (\$ millions)					
Yr Dec	2016A	2017E		2018E	
	Actual	Curr	Prev	Curr	Prev
Mar	3.0	2.2A	—	—	—
Jun	2.8	3.9A	—	—	—
Sep	3.1	4.0	—	—	—
Dec	3.3	6.6	—	—	—
YEAR	12.3	16.7	—	21.5	—

EPS (\$)					
Yr Dec	2016A	2017E		2018E	
	Actual	Curr	Prev	Curr	Prev
Mar	(0.04)	(0.03)A	—	—	—
Jun	(0.04)	(0.03)A	—	—	—
Sep	(0.03)	(0.02)	—	—	—
Dec	(0.03)	(0.02)	—	—	—
YEAR	(0.15)	(0.10)	—	(0.07)	(0.09)

One year price history XXII



XXII: The Solution to Big Tobacco's \$30B Problem. Raise Price Target to \$11.50

Since July 27 the market value of the three Big Tobacco companies controlling 90% of the US market has dropped a cumulative \$30 billion, or 9.4%, while over that same time period the S&P 500 has hit new highs, up 3.1%. The proximate cause of Big Tobacco's decline, in our view, was the FDA's announcement on July 28 to begin a "comprehensive regulatory plan to shift trajectory of tobacco-related disease, death," beginning with a public dialogue about lowering nicotine levels in combustible cigarettes to non-addictive levels through achievable product standards. Estimates vary on what this could cost Big Tobacco, but all the estimates are in the tens of billions. We believe 22nd Century's patents, covering nicotine regulation in tobacco plants, is a solution to Big Tobacco's \$30 billion market value loss, yet its market value has increased only \$140 million. We are raising our price target on XXII to \$11.50 per share or about \$1.4 billion, and we think even that can be exceeded. Assuming the FDA continues on its program, we believe XXII has the opportunity to license its technology to Big Tobacco at a fraction of the cost they are currently contemplating it will take to comply with potential FDA regulations and this could result in a royalties or licensing stream far surpassing today's market cap. While our price target is based on changes in the US market we expect other countries to follow the FDA's lead, opening up additional markets for XXII and higher expected value for the shares.

The core of the FDA's initiative is "lowering nicotine levels in cigarettes to non-addictive levels." This would reduce the likelihood future smokers would become addicted and increase the quit rate of current smokers. We expect this to be a multi-year process. First, the FDA will release an Advanced Notice of Proposed Rulemaking (ANPRM), probably within the next six months, followed by a Notice of Proposed Rulemaking (NPRM) and then a Final rule. Comment periods for the ANPRM and NPRM can each last 6 months or more.

It is important for regulatory agencies to build a case that overcomes the inevitable objections by industry participants, public policy advocates, the general public and Congress. There is a large and growing body of evidence very-low nicotine cigarettes can reduce the harm from cigarettes and lead to greater rates of smoking cessation. The latest study, a 1,250-patient, 20-week study compared smokers assigned to three groups: 1) a group immediately switched to very low nicotine content Spectrum cigarettes, 2) a group smoking progressively lower nicotine content Spectrum brand cigarettes and 3) a group smoking normal nicotine content Spectrum brand cigarettes. The results have not been published but a presentation at the Vermont Center on Behavior and Health's 5th Annual Conference on Tobacco Regulatory Science indicated an immediate reduction has the most optimal outcome for smokers.

Valuation:

Our \$11.50 price target is based on the company garnering royalty revenue for its technology on 10% of the US market share in the next five years.

Risks to achievement of target price:

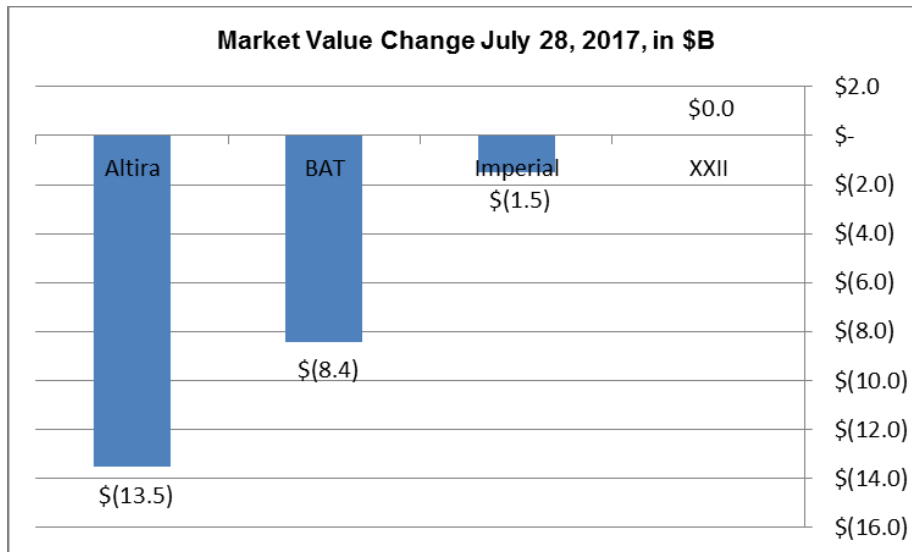
Risks to achieving our price target include delays in the FDA process, ability to find partners for X-22, challenges in attracting contract manufacturing and selling product overseas and possibility of requiring additional capital.

Company description:

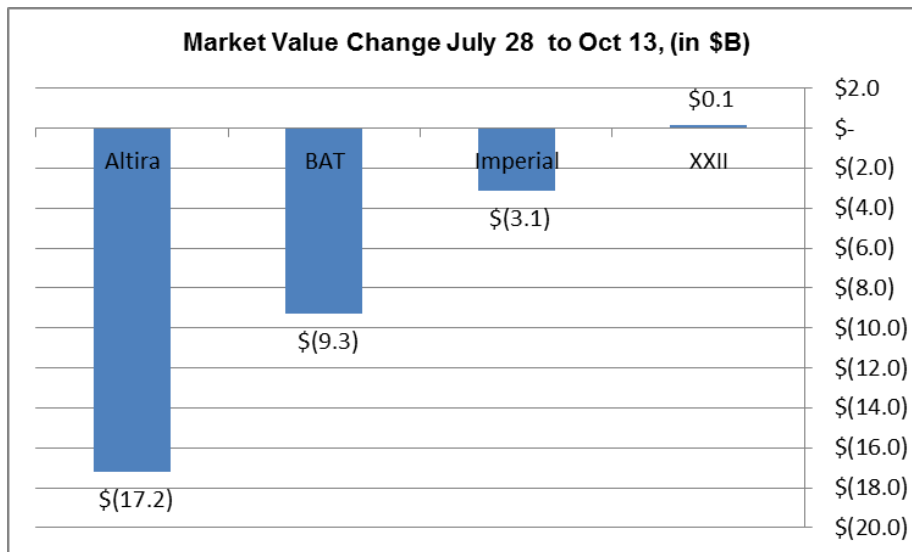
22nd Century owns or exclusively controls over 200 issued patents, 50 pending patent applications. The company's proprietary technology enables the control of nicotine levels in tobacco plants by controlling the genes responsible for nicotine production in tobacco plants.

It is still early in this process and it will take a couple of years for the FDA's final rule to be promulgated and probably a couple more for the market to implement the FDA's rules. There are many potential outcomes of the FDA's final rule including mandates on nicotine levels of all cigarettes, progressive changes on reducing nicotine levels in cigarettes, requiring a certain portion of a manufacturers sales to be low nicotine cigarettes similar to auto-makers fuel economy standards.

The initial FDA announcement of its goal to reduce nicotine levels in cigarettes, on July 28 resulted in a \$23 billion reduction in market value, or about 7.5%, for Altria Group, British American Tobacco and Imperial Brands, which control about 90% of the US market. 22nd Century on that day was up about \$30 million.



The size of the market value decline over the past two and one-half months since the FDA announcement has widened. From July 27th to October 13th the combined market value loss for Altria Group, British American Tobacco and Imperial Brands is \$29.6 billion, versus a \$138 million increase for 22nd Century.



We view this market value loss as investor's collective estimate of the risk-adjusted present value of the change in FDA policy. Since the S&P 500 has increased 3% over this time period the \$30 billion could be even underestimating

the cost of the FDA proposal. The Big 3 US tobacco stocks are down an aggregate 9.4% but the relative decline is 12.5% or close to \$40 billion.

Tobacco stocks have been trading around 15x EBITDA, so the \$30 billion to \$40 billion present value implicit estimate of the cost of complying with the FDA plan is an annual EBITDA cost between \$2 billion and \$2.7 billion. Based on the 11.5 billion packs of cigarettes sold in the US annually that results in the market's estimate of an annual cost between \$0.17 and \$0.23 per pack.

The Director of Product Policy at Philip Morris International, Rolf Lutz, stated last year it would cost \$10 billion to \$12 billion to extract nicotine from all its EU cigarettes. The company sells about 10 billion packs of cigarettes in the EU and applying that ratio to the US market results in a combined industry cost of \$12 to \$14 billion in the US and \$38 billion to \$46 billion for the US and EU combined. Mr. Lutz also indicated it could take up to 20 years to achieve lower nicotine levels with genetically modified plants.

Using either the market's implicit estimates of the cost to comply with the FDA's proposed rule change or Mr. Lutz's estimate of time and money required, the opportunity for 22nd Century is large.

Given the time these changes will take and the stakes involved for the tobacco industry, we view 22nd Century's recent \$54 million equity raise as critical. Large companies regularly try to outlast smaller companies with critical technology counting on their large balance sheet outlasting the smaller. This has proven an effective strategy over the years. But 22nd Century now has five years of cash at current burn rates and has demonstrated its ability to raise significant amount of cash quickly, which nullifies a potential strategy of Big Tobacco to out-wait XXII.

Since the end of September the company is also free of a restrictive license agreement with British American Tobacco. The original agreement, struck in 2013, before the FDA's new regulatory plan was announced, was an important validation of 22nd Century's technology. Under that agreement annual royalties to 22nd Century were capped at \$25 million per year. However, with the FDA regulatory plan and the potential costs involved for the industry, 22nd Century is in a much better position to engage in licensing agreements and strategic partnerships that are much more favorable.

We think a royalty and license model is the most likely path for the company, but not the only one. XXII owns a manufacturing plant in North Carolina and currently, the company is pursuing three paths with the FDA with three different products, two of which have low-nicotine levels: 1) Brand A 2) X-22 and 3) Brand B. A few months ago the company met with the FDA and based on those meetings has decided to "significantly expand" its Modified Risk Tobacco Product (MRTP) application and will request FDA approval of packaging and marketing disclosing that its Brand A Very Low Nicotine cigarettes reduce smokers' exposure to nicotine. Receiving this approval would likely result in greater interest by potential partners in working with XXII.

We still expect 22nd Century to bifurcate the current application into a Premarket Tobacco Product application (PMTA) and MRTP. The PMTA could advance quickly while the MRTPA would likely take 12 months to conclude. This company has also received guidance from the FDA regarding design and implementation of two parallel, Phase III clinical trials of 22nd Century's X-22 prescription-based smoking cessation product. Further work will be required to reach agreement on the construction of these trials which could begin in the first half of 2018, depending on funding.

We expect the company to also receive guidance from the FDA on an MRTP for Brand B, the company's low tar-to-nicotine product. This is a third path for commercialization in a market that has been prevented by government from innovating. However, because of the company's unique technology as well as progress on determining, in conjunction with the FDA, the efficacy of 22nd Century's products on smoking cessation and smoking behavior, it could end up offering a truly innovate product to the market. Approval on these applications can be leverage for the FDA as well in persuading industry to accept potential regulatory changes.

We have increased our price target to \$11.50 per share. The following table is based on a successful royalty/licensing model in the US. There are 12 billion packs of cigarettes sold in the US annually and the table shows potential per share value to XXII at 5%, 10% and 25% market share and per pack royalty of \$0.10, \$0.15, \$0.20 and \$0.25. The per share values presented in the table assume five-years for the FDA rulemaking to complete and industry to respond and a 20% discount rate.

**XXII: Per share Value based on royalty/market share
US Market**

		Market Share		
		5%	10%	25%
Royalty per pack	\$ 0.10	\$ 3.91	\$ 7.82	\$ 19.54
	\$ 0.15	\$ 5.86	\$ 11.72	\$ 29.31
	\$ 0.20	\$ 7.82	\$ 15.63	\$ 39.08
	\$ 0.25	\$ 9.77	\$ 19.54	\$ 48.85

Our price target assumes a \$0.15 per pack royalty and 10% market share in 5 years, discounted at 20%. The \$0.15 per pack royalty is consistent with the implicit investor estimate of the value to Big Tobacco of the regulatory change as well as the estimate articulated by Philip Morris International.

Our estimates currently assumes a five year timeline for XXII to deploy its technology. But as pointed out earlier the company is pursuing multiple paths with the FDA for reduced exposure claims and could conceivable receive authority to state its product has nicotine below addictive levels. Either of these claims could accelerate the time to market and the expected value of the technology. For instance, if instead of using a five year estimate to achieve the market share shown in the table, we use three year estimate, the \$11.50 price target would increase to \$17 per share.

The numbers are significantly larger if we include an estimate for regulatory changes in the rest of the world. New Zealand, Canada, the UK and Finland are all looking at changes in required nicotine levels. Investors have taken notice as on the day of the FDA announcement Philip Morris International did not decline but has fallen about 4% over the past couple of months as the potential for regulatory change has become more likely in the rest of the world.

The table below, similar to the table above, presents XXII per share value using different market share and royalty per pack estimates, but instead of using 12.1 billion packs per year sold in the US, we use the 37.8 billion packs sold per year in the US and EU.

**XXII: Per share Value based on royalty/market share
US and EU Market**

		Market Share		
		5%	10%	25%
Royalty per pack	\$ 0.10	\$ 12.32	\$ 24.63	\$ 61.58
	\$ 0.15	\$ 18.48	\$ 36.95	\$ 92.38
	\$ 0.20	\$ 24.63	\$ 49.27	\$ 123.17
	\$ 0.25	\$ 30.79	\$ 61.58	\$ 153.96

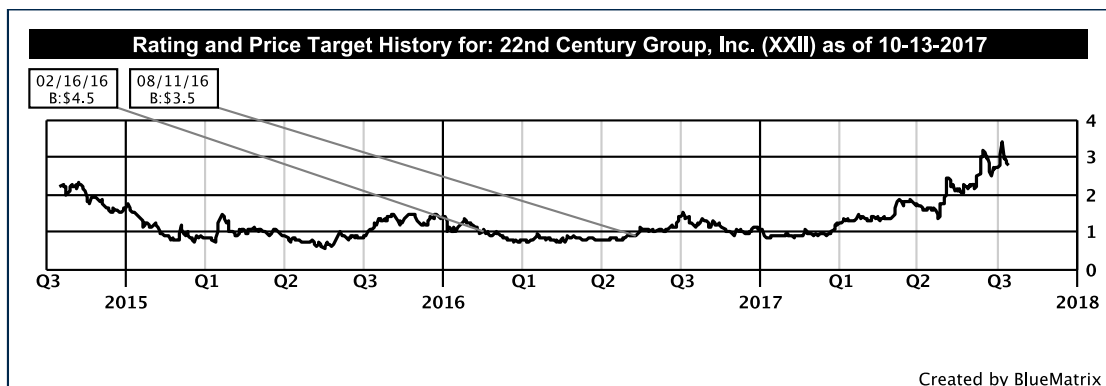
22nd Century Group, Inc
Income Statement \$ in 000s

	2014	2015	2016	Q1 17	Q2 17	Q3 17 E	Q4 17 E	2017 E	2018 E	2019 E
Revenue	\$ 529	\$ 8,522	\$ 12,280	\$ 2,232	\$ 3,897	\$ 5,087	\$ 6,642	\$ 17,858	\$ 21,500	\$ 25,651
Cost Of Goods Sold	498	9,103	12,710	2,505	4,062	4,644	6,021	17,232	19,350	17,359
Gross Profit	31	(581)	(430)	(274)	(165)	444	621	626	2,150	8,291
R&D	1,249	1,669	2,341	551	813	550	550	2,464	2,314	2,661
G&A	8,793	7,760	6,193	1,620	1,805	1,400	1,400	6,226	6,806	7,487
Pre-Mfg. Facility Costs	1,177	0	0					0	0	0
Sales & marketing	86	1,358	1,582	296	268	350	350	1,263	1,242	1,552
Depreciation & Amort.	463	676	842	229	231	193	193	845	770	847
Opex	11,768	11,463	10,958	2,696	3,117	2,493	2,493	10,799	11,132	12,547
Operating Income	\$ (11,737)	\$ (12,044)	\$ (11,388)	\$ (2,970)	\$ (3,283)	\$ (2,049)	\$ (1,872)	\$ (10,173)	\$ (8,982)	\$ (4,255)
Interest Expense	(7)	(22)	(21)	8	4	(2)	(2)	8	(8)	(8)
Other	(30)	889	(202)	346	0	0	0	346	0	0
Warrant Charge	(3,821)	145	30	(5)	(78)	0	0	(83)	0	0
Pretax Income	(15,595)	(11,032)	(11,581)	(2,621)	(3,356)	(2,051)	(1,874)	(9,901)	(8,990)	(4,263)
Income Tax Expense	0	0	0	0	0	0	0	0	0	(1,492)
Net before Minority Interest	(15,595)	(11,032)	(11,581)	(2,621)	(3,356)	(2,051)	(1,874)	(9,901)	(8,990)	(2,771)
Minority Interest	0	0	0					0	0	0
Net to Common	\$ (15,595)	\$ (11,032)	\$ (11,581)	\$ (2,621)	\$ (3,356)	\$ (2,051)	\$ (1,874)	\$ (9,901)	\$ (8,990)	\$ (2,771)
Shares	59,993	68,143	79,843	90,700	91,578	99,888	123,400	101,391	123,500	125,500
EPS	(\$0.26)	(\$0.16)	(\$0.15)	(\$0.03)	(\$0.04)	(\$0.02)	(\$0.02)	(\$0.10)	(\$0.07)	(\$0.02)

22nd Century Group, Inc
Balance Sheet and Cash Flow Statement \$ in 000s

	2014	2015	2016	Q1 17	Q2 17	Q3 17 E	Q4 17 E	2017 E	2018 E
Cash	6,403	3,760	13,468	10,729	12,483	10,965	59,908	59,908	52,853
Due from related party and officers	46	0	0	0	0	0	0	0	0
A/R	0	51	41	2	718	482	528	528	616
Inventory	2,065	2,706	3,093	3,035	4,288	4,814	5,945	5,945	4,973
Prepaid Consulting Fees	1,979	0	0	0	0	0	0	0	0
Prepaid Exp.	214	636	196	434	551	619	764	764	639
Total Current Assets	\$ 10,707	\$ 7,154	\$ 16,797	\$ 14,200	\$ 18,040	\$ 16,880	\$ 67,145	\$ 67,145	\$ 59,082
Patent and Trademark costs	7,078	7,364	7,390	7,439	7,444	7,383	7,321	7,321	7,076
PP&E	2,851	2,556	2,435	2,360	2,272	2,303	2,331	2,331	2,395
Equity Investment	1,318	1,223	1,020	1,366	1,366	1,366	1,366	1,366	1,366
Total Assets	\$ 21,954	\$ 18,296	\$ 27,642	\$ 25,365	\$ 29,122	\$ 27,933	\$ 78,163	\$ 78,163	\$ 69,920
Bank Loans and N/P	495	309	308	314	321	321	321	321	321
A/P	884	1,283	1,340	1,729	2,269	2,547	3,146	3,146	2,631
Accrued Expenses	1,294	1,570	1,601	1,376	1,498	1,681	2,077	2,077	1,737
Deferred Revenue	0	0	0	0	0	0	0	0	0
Total Current Liabilities	\$ 2,673	\$ 3,162	\$ 3,249	\$ 3,419	\$ 4,087	\$ 4,549	\$ 5,543	\$ 5,543	\$ 4,689
Long-Term Debt	605	308	0	0	0	0	0	0	0
Accrued Severance	412	200	0	0	0	0	0	0	0
Warrant Liability & Other	3,043	2,898	59	64	142	142	142	142	142
Shareholder's Equity	15,220	11,729	24,334	21,882	24,893	23,242	72,479	72,479	65,089
Total Liabilities And Equity	\$ 21,954	\$ 18,296	\$ 27,642	\$ 25,365	\$ 29,122	\$ 27,933	\$ 78,163	\$ 78,163	\$ 69,920
Net Income	(15,595)	(11,032)	(11,581)	(2,621)	(3,356)	(2,051)	(1,874)	(9,901)	(8,990)
Depreciation & Amort.	463	774	842	205	150	155	159	668	681
Stock Comp	2,293	1,326	881	169	350	350	350	1,219	1,400
Other	6,740	2,341	241	(318)	78	0	0	(241)	0
Working Capital	(483)	(731)	(270)	(129)	(1,425)	104	(328)	(1,778)	154
Operating Cash Flow	\$ (6,583)	\$ (7,322)	\$ (9,888)	\$ (2,695)	\$ (4,203)	\$ (1,443)	\$ (1,693)	\$ (10,033)	\$ (6,754)
Acquisition of Patents and trademarks	(727)	(413)	(357)	(30)	0	0	0	(30)	0
Capx	(212)	(37)	(197)	(14)	(125)	(125)	(125)	(389)	(500)
Other	(1,769)	0	0	0	0	0	0	0	0
Investing Activities	\$ (2,708)	\$ (451)	\$ (554)	\$ (44)	\$ (125)	\$ (125)	\$ (125)	\$ (419)	\$ (500)
Debt	(4)	(508)	(333)	0	6	0	0	6	0
Equity	9,859	5,592	20,483	0	12,413	50	50,760	63,223	200
Other	7	46	0	0	0	0	0	0	0
Financing Activities	\$ 9,863	\$ 5,130	\$ 20,149	\$ -	\$ 12,420	\$ 50	\$ 50,760	\$ 63,230	\$ 200
Change in Cash	\$ 572	(\$2,642)	\$ 9,708	(\$2,739)	\$ 8,092	(\$1,518)	\$ 48,942	\$ 52,778	(\$7,054)

Required Research Disclosures



Distribution of Ratings/IB Services Chardan Capital Markets

Rating	Count	Percent	IB Serv./Past 12 Mos.	
			Count	Percent
BUY [BUY]	67	67.68	24	35.82
HOLD [NEUTRAL]	30	30.30	2	6.67
SELL [SELL]	1	1.01	0	0.00
NOT RATED [NR]	1	1.01	1	100.00

Regulation Analyst Certification ("Reg AC") —

ANALYST(S) CERTIFICATION: The analyst(s) responsible for covering the securities in this report certify that the views expressed in this research report accurately reflect their personal views about "Company" and its securities. The analyst(s) responsible for covering the securities in this report certify that no part of their compensation was, is, or will be directly or indirectly related to the specific recommendation or view contained in this research report.

DISCLOSURES

Within the last twelve months, Chardan Capital Markets has received compensation for investment banking services from 22nd Century Group, Inc.. This research contains forward looking statements made pursuant to the safe harbor provision of Private Securities Litigation Act of 1995.

Chardan Capital Markets intends to seek compensation for investment banking services from all companies under research coverage. Chardan Capital Markets or its officers, employees or affiliates may execute transactions in securities mentioned in this report that may not be consistent with the report's conclusions.

RATINGS

Buy: Expected to materially outperform sector average over 12 months and indicates total return of at least 10% over the next 12 months.

Neutral: Returns expected to be in line with sector average over 12 months and indicates total return between negative 10% and 10% over the next 12 months.

Sell: Returns expected to be materially below sector average over 12 months and indicates total price decline of at least 10% over the next 12 months.

22nd Century Group, Inc. (XXII) - \$2.80 - Buy

Price Target \$11.50

VALUATION:

Our \$11.50 price target is based on the company garnering royalty revenue for its technology on 10% of the US market share in the next five years.

RISKS TO ACHIEVEMENT OF TARGET PRICE:

Risks to achieving our price target include delays in the FDA process, ability to find partners for X- 22, challenges in attracting contract manufacturing and selling product overseas and possibility of requiring additional capital.

FORWARD- LOOKING STATEMENTS: This Report contains forward- looking statements, which involve risks and uncertainties. Actual results may differ significantly from such forward- looking statements. Factors that might cause such a difference include, but are not limited to, those discussed in the “Risk Factors” section in the SEC filings available in electronic format through SEC Edgar filings at www.SEC.gov on the Internet.

COMPENSATION OR SECURITIES OWNERSHIP: The analyst(s) responsible for covering the securities in this report receives compensation based upon, among other factors, the overall profitability of Chardan Capital Markets including profits derived from investment banking revenue and securities trading and market making revenue. The analyst(s) that prepared the research report did not receive any compensation from the Company or any other companies mentioned in this report in connection with the preparation of this report. The analysts responsible for covering the securities in this report currently do not own common stock in the Company, but in the future may from time to time engage in transactions with respect to the Company or other companies mentioned in the report.

GENERAL: This report is provided for informational purposes only. It is not to be construed as an offer to buy or sell a solicitation of an offer to buy or sell any financial instruments or to particular trading strategy in any jurisdiction. The information and opinions in this report were prepared by registered employees of Chardan Capital Market. The information herein is believed by Chardan Capital Market to be reliable and has been obtained from public sources believed to be reliable, but Chardan Capital Market makes no representation as to the accuracy or completeness of such information. Opinions, estimates and projections in this report constitute the current judgment of the author as of the date of this report. They do not necessarily reflect the opinions of Chardan Capital Market and are subject to change without notice. In addition, opinions, estimates and projections in this report may differ from or be contrary to those expressed by other business areas or group of Chardan Capital Market and its affiliates. Chardan Capital Market has no obligation to update, modify or amend this report or to otherwise notify a reader thereof in the event that any matter stated herein, or any opinion, projection, forecast or estimate set forth herein, changes or subsequently becomes inaccurate.

Chardan Capital Market does not provide individually tailored investment advice in research reports. This report has been prepared without regard to the particular investments and circumstances of the recipient. The securities discussed in this report may not be suitable for all investors and investors must make their own investment decisions using their own independent advisors as they believe necessary and based upon their specific financial situations and investment objectives. Estimates of future performance are based on assumptions that may not be realized. Furthermore, past performance is not necessarily indicative of future performance.

Chardan Capital Market salespeople, traders and other professionals may provide oral or written market commentary or trading strategies to our clients that reflect opinions that are contrary to the opinions expressed in this research.

Electronic research is simultaneously available to all clients. This report is provided to Chardan Capital Market clients and may not be redistributed, retransmitted or disclosed, in whole or in part, or in any form or manner, without the express written consent of Chardan Capital Market. Receipt and review of this research report constituted your agreement not to redistribute, retransmit, or disclose to others the contents, opinions, conclusion or information contained in this report (including any investment recommendations, estimates or target prices) without first obtaining express permission from Chardan Capital Market.

This report is not intended for distribution to, or use by any person or entity in any jurisdiction or country where such distribution or use would be contrary to local law or regulation.

For investors in the UK: In making this report available, Chardan Capital Market makes no recommendation to buy, sell or otherwise deal in any securities or investments whatsoever and you should neither rely or act upon, directly or indirectly, any of the information contained in this report in respect of any such investment activity. This report is being directed at or distributed to , (a) persons who fall within the definition of Investment Professionals (set out in Article 19(5) of the Financial Services and Markets Act 2000 (Financial Promotion) Order 2005 (the “Order”)); (b) persons falling within the definition of high net worth companies, unincorporated associations, etc. (set out in Article 49(2) of the Order); (c) other persons to whom it may otherwise lawfully be communicated (all such persons together being referred to as “relevant persons”). This report must not be acted on or relied on by persons who are not relevant persons.