Initiating Coverage
January 10, 2014
Agriculture Technology

22nd Century Group, Inc. (XXII - $1.80)

COMPANY NOTE

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Sales and trading 7 a.m. to 7 p.m. ET, (646) 465-9090
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Stock Data	01/10/14
Price	$1.80
52 Week Range	($0.46 - $2.19)
Price Target	$9.00
Market Cap (mil)	$102.96
Shares out (mil)	57.20
3-Mo Avg Vol	263,983
Cash per share	$0.10
Total Debt (mil)	$0.18

General: Cash per share and debt pro forma for the warrant exchange.

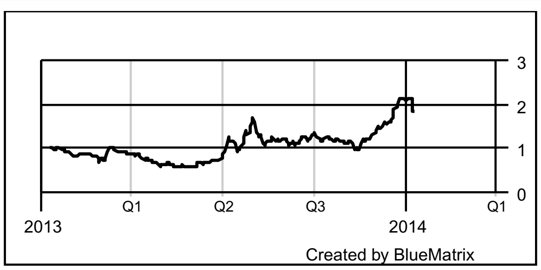
EPS ($)

Yr Dec	2012A	2013E	2014E
	Actual	Curr	Curr
Mar	(0.08)	(0.07)A	(0.03)
Jun	–	(0.01)A	(0.04)
Sep	(0.01)	(0.32)A	0.00
Dec	(0.13)	(0.08)	0.00
YEAR	(0.22)	(0.51)	(0.07)
P/E	(8.2)x	(3.5)x	(25.7)x

Revenues ($ millions)

Yr Dec	2012A	2013E	2014E
	Actual	Curr	Curr
Mar	0.0	0.0A	0.5
Jun	–	0.0A	0.3
Sep	0.0	0.1A	2.8
Dec	0.0	6.8	3.5
YEAR	0.0	6.9	7.0

One year price history XXII



Initiating Coverage with Buy and $9 Target. Add to Top Picks List

We are initiating coverage of 22nd Century Group with a Buy recommendation and a $9 target. The stock is one of our Top Picks for the year given its significant upside potential and multiple near-term catalysts.

Beginning in Q4 2013 we expect meaningful revenues to begin from a number of sources including a license agreement with British American Tobacco (BAT) and commercial product sales from the company's proprietary RED SUN and MAGIC brands. Over the longer-term 22nd Century will pursue the $1 billion US smoking-cessation market with its proprietary X-22 cigarette, and will file with the FDA applications for modified risk cigarettes. We believe there are multiple near-term catalysts for the stock, including an up-listing, inclusion in the modified settlement agreement (MSA), beginning of production in North Carolina and a potential FDA award for research cigarettes. The stock has reacted favorably due to growing awareness of these catalyst as well as the recent warrant exchange which cleans up the capital structure and resulted in a cash balance of $6 million.

22nd Century owns or exclusively controls 113 issued patents and 37 patent applications which gives it exclusive worldwide rights to all uses for certain genes that control nicotine content in tobacco plants. 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.

The value of this technology was validated by BAT in October of 2013 when it signed a worldwide research license agreement with 22nd Century. The company received a $7 million payment in Q4 of 2013 and we expect $3 million of license revenue from BAT in 2014 and an additional $4 million in 2015. BAT has the option to turn this research license into a royalty-bearing commercial license at any time.

22nd Century announced the purchase of NASCO, a member of the Master Settlement Agreement (MSA) in September of last year and the deal's closing will take place following the consent of the National Association of Attorneys General (NAAG). NAAG approval sets off a chain of events, including distribution agreements that will result in commercial sales this year.

Our $9 price target uses a sum of the parts method, valuing the BAT license stream at $1.67 per share, the commercial product revenue at $4.34 per share and the combined modified risk/X-22 at $3 per share. Risks to achieving this target include increased regulation, inability to obtain MSA membership, delays in finalizing distribution agreements and commercial license revenue lower than expectations.

Investment Summary:

We are initiating coverage of 22nd Century Group with a Buy recommendation and a $9 target. Beginning in Q4 2013 we expect meaningful revenues to begin from a number of sources including a license agreement with British American Tobacco (BAT) and commercial product sales from the company's proprietary RED SUN and MAGIC brands. Over the longer-term 22nd Century will pursue the $1 billion US smoking-cessation market with its proprietary X-22 cigarette, and will file with the FDA applications for modified risk cigarettes. We believe there are multiple near-term catalysts for the stock, including an up-listing, inclusion in the modified settlement agreement (MSA), beginning of production in North Carolina and a potential FDA award for research cigarettes. The stock has reacted favorably recently due to growing awareness of these catalyst as well as the recent warrant exchange which cleans up the capital structure and resulted in a cash balance of $6 million.

Valuation:

We approached valuation from a sum-of-the-parts perspective to arrive at our $9.00 price target. We discounted the projected BAT license revenue at 10% and in the low case assumed the license terminated in 2028, while in the high case we assumed the license was extended by an additional 15 years.

For the commercial products we assume RED SUN can achieve $142 million in sales by 2023 and MAGIC $55 million by the same year. Our EV/Sales valuation ranges are comparable to the 3.6x to 5.2x EV/Sales multiples awarded to Altira, British American Tobacco, Lorillard, Reynolds American and Philip Morris International.

Our modified risk/X-22 valuation of $2 to $4 per share is derived in a number of ways. E-cigarette makers, Victory Electronic Cigarettes and Vapor Corp., proxies for modified risk valuations, have enterprise values of $499 million and $141 million respectively. This equates to $2.42 per share using the lower EV as a bogie. X-22 valuation using a modest market share of the smoking cessation market and EV/Sales of 2x to 3x also yields per share valuation to 22nd Century of over $2 per share. We have heavily discounted these assumptions due to the longer-term nature of development of these lines of business as well as the additional capital required for them.

Risks to achievement of target price:

Risks to achieving our price target: NAAG approval of the NASCO purchase is critical and assumed to occur this quarter. Lacking that approval we believe it will be difficult for the company to achieve our domestic RED SUN estimates. We have also assumed the commercial product growth trajectory will be similar to American Spirit, but changes in the industry can hinder 22nd Century from achieving our estimates. We have also assumed the BAT license will change from a research license to a commercial royalty-bearing license, but that too is not assured. The industry is subject to significant regulatory constraints, litigation, societal views on smoking and changing legislation. Any one of these could have a deleterious impact on our assumptions.

Company description:

22nd Century owns or exclusively controls 113 issued patents and 37 patent applications which gives it exclusive worldwide rights to all uses for certain genes that control nicotine content in tobacco plants. 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. This can be accomplished with or without genetic engineering.

Initiating Coverage with Buy and $9 Target

We are initiating coverage of 22nd Century Group with a Buy recommendation and a $9 target. To date 22nd Century has been a development-stage company but beginning in Q4 2013 and into 2014 we expect meaningful revenues to begin from a number of sources including a license agreement with British American Tobacco (BAT), commercial product sales from the company's proprietary RED SUN and MAGIC brands, and delivery of SPECTRUM research cigarettes and leaf tobacco to NIDA and FDA respectively. Over the longer-term 22nd Century will pursue the $1 billion US smoking-cessation market with its proprietary X-22 cigarette, and will file with the FDA applications for modified risk cigarettes. We believe there are multiple near-term catalysts for the stock, including an up-listing, inclusion in the modified settlement agreement (MSA), beginning of production in North Carolina and a potential FDA award for research cigarettes. The stock has reacted favorably due to growing awareness of these catalyst as well as the recent warrant exchange which cleans up the capital structure and resulted in a cash balance of $6 million.

22nd Century owns or exclusively controls 113 issued patents and 37 patent applications which gives it exclusive worldwide rights to all uses for certain genes that control nicotine content in tobacco plants. The company's proprietary technology enables the control of nicotine levels in tobacco plants by controlling the genes responsible for nicotine production in tobacco. This can be accomplished with or without genetic engineering as the company recognizes some customers desire to avoid genetically modified products. The technology is critical to the company's supply agreements with the National Institute of Drug Abuse (NIDA) and the FDA as well as the basis for the company's X-22 smoking cessation product and applications to the FDA for modified risk cigarettes labels.

The value of this technology was validated by BAT in October of 2013 when it signed a worldwide research license agreement with 22nd Century. The company received a $7 million payment in Q4 of 2013 and we expect $3 million of license revenue from BAT in 2014 and an additional $4 million in 2015. BAT has the option to turn this research license into a royalty-bearing commercial license at any time. We have modeled this to happen at the end of the research agreement but if this occurs sooner, it would be a major catalyst for the shares.

22nd Century announced the purchase of NASCO, a member of the Master Settlement Agreement (MSA) in September of last year and the deal's closing will take place following the consent of the National Association of Attorneys General (NAAG). The MSA is critical to introducing commercial products in the US and 22nd Century will manufacture its RED SUN brand for US consumption at a Mocksville, North Caroling facility purchased last month. NAAG approval sets off a chain of events, including distribution agreements that will result in commercial sales this year.

There are other multiple catalysts that will highlight the value of the company's technology likely to occur over the next twelve months. These include filing with the FDA for modified risk cigarettes, a partner for phase III testing of the X-22 smoking cessation product, introduction of commercial products in additional international markets and potential award of an FDA contract for research cigarettes.

Our $9 price target uses a sum of the parts method, valuing the BAT license stream at $1.67 per share, the commercial product revenue at $4.34 per share and the combined modified risk/X-22 at $3 per share. Risks to achieving this target include increased regulation, inability to obtain MSA membership, delays in finalizing distribution agreements and commercial license revenue less than expectations.

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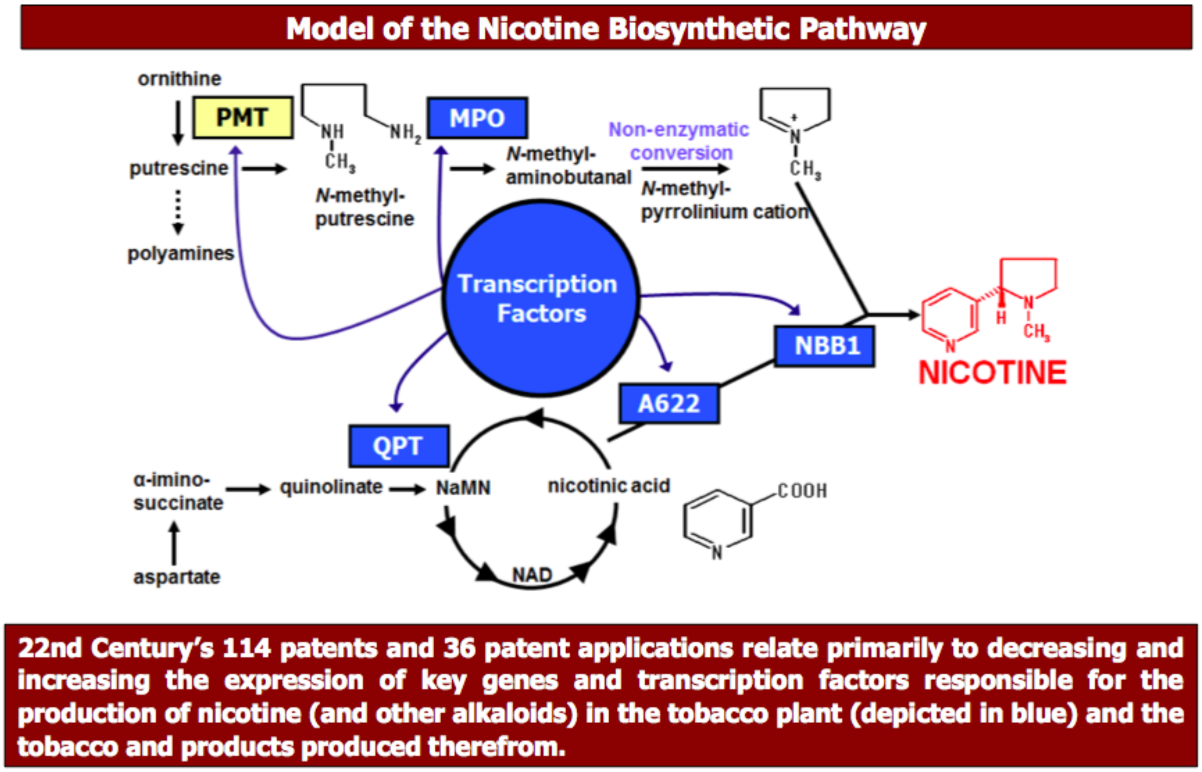


Source: 22nd Century Group

The company has exclusive worldwide rights to the QPT, A622, NBB1, MPO and genes for several transcription factors which are responsible for the nicotine content in tobacco plants. 22nd Century also has exclusive rights to plants where modifying these gene expressions have changed the nicotine content of tobacco plants. 22nd Century also has the exclusive right to license and sublicense these patent rights. The company's technology allows it to control the amount of nicotine in tobacco plants and cigarettes and enables the creation of differentiated and premium-priced products.

This technology is the basis for all of the company's short and long-term opportunities:

1) BAT research license resulting in payments of up to $14 million over the next few years and an option for a royalty-bearing commercial license. We estimate if BAT enters into the royalty-bearing commercial license, even at modest volumes, the present value of the discounted cash flows is $1.23 to $2.10 per share.

2) 22nd Century has entered into a binding agreement to purchase NASCO Products, an MSA member, which will take place immediately following NAAG approval of the purchase. An MSA membership is critical to sell and distribute tobacco products in the US. Manufacturing will be accomplished with the purchase in December 2013 of a manufacturing facility in Mocksville,

North Carolina. Assuming NAAG approval is received within the next 60 days, 2014 will be first year of volume sales of the company's proprietary RED SUN brand.

3) In 2013 22nd Century granted exclusive distribution rights for the MAGIC brand to a Dutch distributor serving the Benelux countries and exported a modest amount of this very low nicotine (VLN) cigarette in the third quarter. Exports should increase in 2014 to the Benelux countries and additional countries. This will be enabled by the purchase of the manufacturing facility in Mocksville.

4) The FDA intends to award a $6.7 million sole-source contract for cigarette reference products to create a high-quality database of different cigarette characteristics including, tar, nicotine, carbon dioxide, and HPHCs (harmful and potentially harmful constituents). The reference cigarettes could also be used as a benchmark for companies seeking to apply for modified-risk products with the FDA. 22nd Century has partnered for this contract, which is scheduled to be awarded this year.

5) 22nd Century intends to submit a modified risk application for two cigarettes, Brand A (a very-low nicotine, VLN, cigarette) and Brand B (a low tar-to-nicotine, TNR, ratio), with the FDA this year. Under the Family Smoking Prevention and Tobacco Control Act, or the Tobacco Control Act, manufacturers must apply to the FDA for approval to make modified risk claims.

6) X-22 is a VLN cigarette under development by 22nd Century to be used as a prescription smoking cessation aid. The company is seeking a joint venture partner to fund clinical trials that can be used in conjunction with available Phase II studies which show improved quit rates for subjects using VLN in conjunction with other therapies.

License Revenue

BAT and 22nd Century signed a worldwide research license agreement in October, 2013, that gave BAT rights to three of 22nd Century's patent families, totaling 28 granted and applied-for patents. 22nd Century received $7 million (less a $414 thousand payment to a licensor) in Q4 of 2013 and we expect $3 million of license revenue from BAT in 2014 and an additional $4 million in 2015. BAT has the option to turn this research license into a royalty-bearing commercial license at any time. We have modeled this to happen at the end of the research agreement but if this occurs sooner, it would be a major catalyst for the shares.

The commercial license expires in 2028, but is likely to be extended by 5 to 15 years if Plant Variety Rights (PVR) are granted to a product licensed under the BAT agreement. PVR are granted for plant varieties that differ from known varieties by at least one significant biological characteristic.

With modest commercial success by BAT, and license revenues ending in 2028 we calculate the present value at about $1.23 per share. If the agreement extends to 2043 due to PVR grants, we think the present value of the license revenue is about $2.10 per share. BAT is the second largest (outside China) tobacco company in the world, with diversified global operations and 20% share of the non-China market. Given the scale and scope of BAT's operations, we believe there is a good chance of success with commercial royalties hitting our estimates for an extended period.

Commercial Products: RED SUN and MAGIC

Globally, over 5.5 trillion cigarettes are sold annually generating over $700 billion in annual sales, with China accounting for about 40% of global consumption. Market share is concentrated. British American Tobacco, Imperial Tobacco, Japan Tobacco and Philip Morris International account for about 75% of sales outside China. The US market is sizeable, about $45 billion in sales, and also concentrated, with Philip Morris USA, Reynolds American and Lorillard, accounting for 90% of the market. Over the past five years, unit consumption has declined at about a 4% compound rate, although price increases have offset that decline. Industry activity is limited by a large number of local, state and federal laws, regulations and rules. Two of the most important are the 1998 Master Settlement Agreement and the 2009 Tobacco Act.

In 1998 the attorneys general of 46 states (all but Mississippi, Florida, Texas and Minnesota which had settled earlier with the tobacco industry) and the four largest domestic tobacco companies (Philip Morris Inc., R. J. Reynolds, Brown & Williamson and Lorillard) entered into a Master Settlement Agreement (MSA) settling the state's Medicaid lawsuits against the industry for tobacco-related health-care costs and exempted them from private tort liability. The MSA sets restrictions on advertising, lobbying, sponsorship, requires the signatories to fund a public education foundation and make annual payments to the states based primarily on the number of cigarettes sold. Subsequent to the 1998 agreement over 40 tobacco producers have joined the MSA. Membership in the MSA is critical to any tobacco producer as there are financial incentives to join and most in the industry are reluctant to do business with a non-member.

22nd Century introduced two super-premium cigarette brands, RED SUN and MAGIC, into the US market in 2011. Sales have been constrained, since attempts to engage an MSA-member to contract manufacture the brands were unsuccessful. With the upcoming NAAG approval of the NASCO sale, and the recent purchase of manufacturing equipment in Mocksville, 22nd Century will have the MSA membership necessary to pursue the commercial relationships required to distribute its products and manufacturing assets to free it from reliance on contract manufacturers.

In 2009, the Family Smoking Prevention and Tobacco Control Act, or the Tobacco Control Act, gave the Food and Drug Administration (FDA) authority to regulate the tobacco industry's manufacturing, marketing and distribution of tobacco. The Tobacco Act, among other things, requires proof of age to purchase tobacco products, limits the color and design of packaging and advertisements, banned sponsorship of sporting and entertainment events, requires revised warning labels and prohibits reduced harm claims but the FDA cannot ban certain classes of tobacco products, cannot require zero nicotine yields, and cannot require prescriptions to purchase tobacco products.

The market is highly concentrated, with three players generating 90% of the industry's $45 billion in annual domestic sales and the MSA and The Tobacco Act makes it difficult for new entrants. The challenge for 22nd Century will be to market in an industry that essentially prevents marketing by manufacturers to consumers and where retail prices increases have reduced consumer demand and at times shifts demand to value brands.

Source: "The Tax Burden on Tobacco, Volume 46"

Once the NAAG approval is granted and 22nd Century begins volume manufacturing it still has significant hurdles to clear. The company will be introducing super-premium brands into a market that could move further towards value brands with continued price hikes and excise tax increases. One result of the increased retail price is declining demand, but another impact has been a shift away from premium and super-premium brands to value and generic brands. It is also subject to the marketing restrictions of the Tobacco Control Act that could limit its effectiveness in introducing a super-premium brand.

The good news is the market is very large, over $45 billion in annual sales, even a small share for 22nd Century would have a significant impact of financial results. Also, this market is familiar to management which has extensive ties to tobacconists and distributors. There are multiple entry points with over 10,000 tobacconists and 40,000 independent retailers in the US served direct and via wholesale distributors. Our estimates assume the company is able to sign a retailer shortly after receiving NAAG consent of the NASCO purchase and generates $4.5 million in revenue in the twelve months following those events. We assume sales increase sharply in 2015 and again in 2016 with increased uptake at initial retailers, additional retailers selling the product and ultimately a major distributor agreeing to bring the product to the over 50,000 tobacconists and independent retailers in the US.

We assume RED SUN will generate $2.5 million in revenue in 2014, over $9 million in 2015 and $20 million in 2016. We also have the company's MAGIC brand expanding in the European market this year with a growth trajectory that is similar to RED SUN.

Some of the management at 22nd Century were previously with Santa Fe Natural Tobacco, maker of the American Spirit brand, from 1997-2002 and grew revenues from $30 million to $145 million before Santa Fe was sold to R.J. Reynolds for $356 million. We are projecting a similar growth trajectory for RED SUN and MAGIC. The marketing and advertising restrictions of the Tobacco Act will make it more difficult for 22nd Century to achieve the same growth rate as Santa Fe. However, the Act has also limited the ability and the desire of big tobacco to invest in super-premium brands while tobacconists and independent retailers desire super-premium brands that can generate higher margins. There also could be a positive impact on sales of RED SUN when 22nd Century files its application for modified risk tobacco sometime this year.

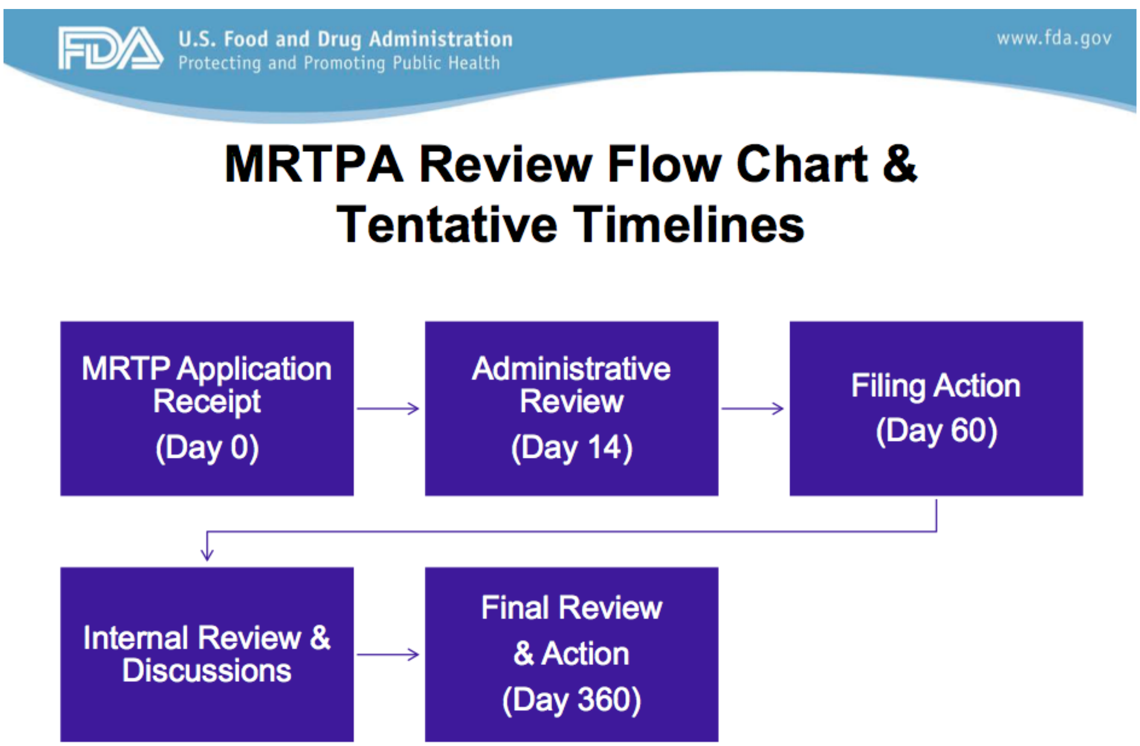
If RED SUN and MAGIC hit our estimates, we believe the value of those commercial products, based on an EV/Sales of 3x to 4x and a discount rate of 10% to 15%, is between $2.90 and $5.77 per share.

Modified Risk

The Tobacco Control Act prohibits reduced-harm claims and in June 2010 banned labels or advertising with the terms, “low,” “light,” “mild” and other similar descriptions. In April 2012 the FDA published draft guidance for applications to market tobacco products as modified or lower risk products. The FDA shall issue a modified risk order

> only if it determines the applicant has demonstrated that the product, as it is actually used by consumers, will:
> - •Significantly reduce harm and the risk of tobacco-related disease to individual tobacco users; and
> - •Benefit the health of the population as a whole taking into account both users of tobacco products and persons who do not currently use tobacco products.
>
> *Source: FDA, “Modified Risk Tobacco Production Applications Draft Guidance”*

The language of the guidance gives the FDA considerable latitude and modified risk applications must include all research documents, both favorable and unfavorable that supports the modified risk claim as well as data on how consumers actually use the product. The process itself is likely to be lengthy, with an extensive research period followed by a one-year decision process by the FDA.



Source: “Journey of the Modified Risk Tobacco Product (MRTP) Application.” April 30, 2013 FDA presentation to TPSAC

Since the Tobacco Control Act banned terms (e.g. low tar, light), and these labels comprised 70% of the US market prior to the Act, we think it is reasonable to believe there is a strong consumer preference for modified risk cigarettes and company that is able to overcome the hurdles of the MRTP application process could reap significant financial benefits.

We expect 22nd Century to file modified risk applications this year for two brands: a very low nicotine (VLN) cigarette, Brand A, and a low tar-to-nicotine (TNR) ratio cigarette, Brand B. The VLN Brand A cigarette is designed to have 95% less nicotine than cigarettes previously labeled "light" brands. The low TNR Brand B cigarette is designed to have a TNR ratio 50% of the majority if cigarettes in the market currently.

Comments by former FDA commissioner David Kessler and current head of the FDA's Center for Tobacco Products, Mitch Zeller suggest there is an appetite within the FDA for very low nicotine cigarettes as an effective path to reducing smoking.

There are a variety of independent studies demonstrating various benefits from a VLN cigarette. Hatsukami, et al, in a 2010 article for the publication *Addiction* showed,

> 0.05 mg cigarettes were not associated with compensatory smoking behaviors. Furthermore, the 0.05 mg cigarettes and nicotine lozenge were associated with reduced carcinogen exposure, nicotine dependence and product withdrawal scores. The 0.05 mg cigarette was associated with greater relief of withdrawal from usual brand cigarettes than the nicotine lozenge. The 0.05 mg cigarette led to a significantly higher rate of cessation than the 0.3 mg cigarette and a similar rate as nicotine lozenge.
>
> CONCLUSION:
>
> The 0.05 mg nicotine yield cigarettes may be a tobacco product that can facilitate cessation; however, future research is clearly needed to support these preliminary findings.

Studies on low TNR cigarettes also show the health benefits relative to the majority of cigarettes on the market today. The company estimates it will cost at least $2 million per brand to complete the FDA authorization process and the total amount required will depend on the number of trials required by the FDA. We have assumed an increase in costs for the company beginning this year is partially due to the modified risk application and possible additional studies required. However, our expense estimates could be low. We have not included any revenue from the ultimate authorization of Brand A or Brand B.

X-22

22nd Century is targeting the $1 billion US smoking cessation market in the US with X-22, a VLN prescription smoking cessation aid. X-22 would be used in conjunction with Chantix or NRT (nicotine replacement therapy) products. The company completed a Phase II-B clinical trial in Q1 2012 which did not demonstrate a statistically significant difference in quit rates between X-22 and a cigarette containing standard nicotine levels. It believes it may have reduced nicotine levels too far as X-22 had nicotine levels half that of VLN cigarettes used in successful trials.

Six independent cessation trials with VLN cigarettes used in conjunction with NRT have shown encouraging results.

Phase II	U of Minnesota Masonic Cancer Center www.ncbi.nlm.nih.gov/pubmed/20078491
Phase III	Clinical Trials Research Unit, University of Auckland. www.ncbi.nlm.nih.gov/pubmed/22594651 http://nihi.auckland.ac.nz/sites/nihi.auckland.ac.nz/files/pdf/addictions/reliq_poster.pdf
Phase II	Vector Tobacco www.ncbi.nlm.nih.gov/pubmed/18629723
Phase II	Roswell Park Cancer Institute www.ncbi.nlm.nih.gov/pubmed/17978987
Phase II	Queen Mary University (partial results disclosed) http://clinicaltrials.gov/ct2/show/NCT01250301
Phase II	University of Minnesota Masonic Cancer Center follow-up study http://clinicaltrials.gov/ct2/show/NCT01050569?term=NCT01050569&rank=1

The company's next step is to engage a joint venture partner to fund further trials, after which would be a 2+ year process with the FDA for regulatory approval.

The smoking cessation market in the US is a $1 billion annual opportunity. The largest prescription smoking cessation aid on the market is Pfizer's Chantix with sales of $670 million in 2012. Chantix revenues have been declining since 2009 when the FDA required a black box label on both Chantix and Zyban due to the significant risks of side effects. Other NRT products include gum, patches, nasal sprays, inhalers and lozenges. Some NRT products have been sold in the US for decades with limited effectiveness. Estimates of other NRT product sales in the US are about $500 million annually.

We believe the combined value of the modified risk and X-22 initiatives total $2 to $4 per share. Modified risk could capture significant market share since it would be the only product on the market with a modified risk label. Given the demand for modified risk cigarettes, the take-up rate could be quick and substantial. In addition, the filing of the application could have a positive halo effect on RED SUN sales in the US. Frankly, this alone could have a value of $2 to $4 per share. E-cigarette makers, Victory Electronic Cigarettes and Vapor Corp., both of which can be regarded as proxies for super-premium and modified risk (at least in the minds of consumers) sport enterprise values of $499 million and $150 million respectively, and with modest trailing twelve months sales of $3.1 million and $23.5 million respectively. The Vapor Corp. enterprise value would equate to over $2.50 per share for 22nd Century.

X-22 also has a substantial market opportunity. If the product were approved and captured a modest percentage of the market, the value to 22nd Century, we believe, would be close to $1.50 per share. Our estimate of a $2 to $4 per share value for modified risk and X-22 assumes a significant haircut to what we believe is the potential value and reflects the significant regularly hurdles to overcome and testing that needs to take place as well as capital that needs to be committed.

Research Cigarettes

Since 2011, 22nd Century has delivered 11.7 million SPECTRUM cigarettes to the National Institute of Drug Abuse (NIDA), an agency of the Department of Health and Human Services, received an order to deliver 5.5 million additional SPECTRUM cigarettes and also received an order to deliver to the FDA VLN fine cut tobacco. The dollar amounts are relatively modest, totaling about $1.5 million, including the pending deliveries. For all of these deliveries, the company is a sub-contractor to RTI International.

In September, the FDA posted (http://grants.nih.gov/grants/guide/rfa-files/RFA-FD-14-001.html) a notice of intent to award a $6.7 million contract for a reference cigarette program. We believe the award will be made sometime in Q1. 22nd Century is a subcontractor on a bid for this award. We have not included a win in our estimates.

Major cash inflow/(outflow) since September quarter end.

At the end of the September quarter the company was sitting on a $1 million cash balance but there has been significant activities since, resulting in cash of close to $6 million by the end of December. Major cash inflows were the $7 million license payment from BAT and $3.6 million raised in a warrant exchange. The warrant exchange had the added benefit of cleaning up the capital structure and removing most of a volatile warrant liability, whose changes flowed through the income statement. An increase in the stock price increased the warrant liability and that change in Q3 was $14 million which was reflected in the income statement as an expense. The warrant exchange reduced the warrant liability from $18.6 million to $1.2 million and reduced warrants outstanding from 19.6 million to 10.6 million.

The company used the cash to pay off $1.1 million in debt, accrued interest and accrued expenses, a $414 thousand payment to a licensor, $491 thousand to North Carolina State University, $3.2 million for manufacturing equipment and it is scheduled to pay $200 thousand for NASCO when NAAG approval of the MSA transfer is received.

Major cash inflow/(outflow) since September quarter end.

09/30/13	Beginning Cash	$1,036
10/01/13	BAT license payment	$7,000
10/01/13	Payment to licensor	$(414)
10/01/13	NP, Accrued Interest. Acc Exp	$(1,380)
10/02/13	NCSU	$(491)
Q1 14	NASCO	$(200)
12/03/13	Equipment	$(3,220)
12/16/13	Warrant Exchange	$3,600
	Change in Cash	$4,895
	PF Cash	$5,931

This nets cash of about $6 million and would be the largest cash balance in the company's history and place it in a much stronger position to execute the multiple initiatives underway.

Outlook and Valuation

For 2013 we have revenue of $6.9 million: $7 million gross from BAT less a $414 thousand payment to a licensor, $225 thousand for a shipment to NIDA, both Q4 events, and a small amount from a shipment of MAGIC to the Netherlands in Q3. We have opex of about $1.5 million for Q4 which is similar to prior quarters. Operating income is projected to be $5.2 million for the quarter and $1.1 million for the year. There are substantial warrant charges in Q4 and for the year that will more than offset the positive operating income. Through the September quarter warrant charges totaled $13.5 million and we expect another charge of $9.4 million in Q4, about two-thirds from the mark-to-market of the warrants before they were exchanged and one-third from the implied inducement cost of lowering the strike price on some warrants to incentive exercise. These are non-cash charges. We project a net loss of $4.2 million for the quarter, and $22.6 million for the year. Cash at year-end is projected to be $5.9 million and share count of 58 million.

For 2014 we have revenue of $6.9 million: $3 million from the BAT license agreement, $2.5 million from RED SUN and $1 million from MAGIC. 90% of our revenue projections occur in the second half. Our RED SUN estimates require NAAG approval of the NASCO sale in Q1. Without that approval it is unlikely the company will be able to sign agreements with tobacconists to carry its product. Clearly, our estimates are also highly dependent on 22nd Century engaging with tobacconists to carry RED SUN. Recalcitrance, reluctance and delays will be detrimental to our projections. We assume product gross margins of 50% and an increase in opex to about $2.2 million per quarter from $1.4 million in 2013. Part of this reflects the roll-out of RED SUN, part due to increased overhead associated with the manufacturing operations and some expectation of spending on longer term initiatives like the smoking cessation application with the FDA and seeking a partner for X-22 phase III trials.

For the out years we assume the BAT research license turns into a commercial royalty bearing license in 2016. We also assume RED SUN tracks the growth trajectory of American Spirit, while MAGIC is about one-third of RED SUN’s levels. We believe there is play in our estimates. We have not assumed there is a positive halo effect on either RED SUN or MAGIC from 22nd Century filing a modified risk application with the FDA, even though we think the publicity is likely to have some impact. We also believe if there are delays to RED SUN, the company would focus more attention on MAGIC where the regulatory regime is less onerous.

We have not assumed additional NIDA or FDA procurements and we have not assumed any contribution from modified risk or X-22.

We approached valuation from a sum-of-the-parts perspective to arrive at our $9.00 price target. We discounted the projected BAT license revenue at 10% and in the low case assumed the license terminated in 2028, while in the high case we assumed the license was extended by an additional 15 years.

22nd Century Valuation Range-Per Share

	Low	High	Mid-Point
BAT License	$1.23	$2.10	$1.67
Commercial Products	$2.90	$5.77	$4.34
Modified Risk/X-22	$2.00	$4.00	$3.00
Total	$6.13	$11.87	$9.00

Source: Chardan Capital Markets

For the commercial products we assume RED SUN can achieve $142 million in sales by 2023 and MAGIC $55 million by the same year. Our EV/Sales valuation ranges are comparable to the 3.6x to 5.2x EV/Sales multiples awarded to Altira, British American Tobacco, Lorillard, Reynolds American and Philip Morris.

Commercial Product Valuation Range-Per Share

	EV/Sales		
i	3.0x	3.5x	4.0x
10.0%	$4.33	$5.05	$5.77
12.5%	$3.54	$4.13	$4.72
15.0%	$2.90	$3.39	$3.87

Source: Chardan Capital Markets

Our modified risk/X-22 valuation of $2 to $4 per share is derived in a number of ways. E-cigarette makers, Victory Electronic Cigarettes and Vapor Corp., proxies for modified risk valuations, have enterprise values of $499 million and $141 million respectively. This equates to $2.42 per share using the lower EV as a bogie. X-22 valuation using a modest market share of the smoking cessation market and EV/Sales of 2x to 3x also yields per share valuation to 22nd Century of over $2 per share. We have heavily discounted these assumptions due to the longer-term nature of development of these lines of business as well as the additional capital required for them.

Clearly there are risks to achieving our price target. NAAG approval of the NASCO purchase is critical and assumed to occur this quarter. Lacking that approval we believe it will be difficult for the company to achieve our domestic RED SUN estimates. We have also assumed the commercial product growth trajectory will be similar to American Spirit, but changes in the industry can hinder 22nd Century achieving our estimates. We have also assumed the BAT license will change from a research license to a commercial royalty-bearing license, but that too is not assured. The industry is subject to significant regulatory constraints, litigation, societal views on smoking and changing legislation. Any one of these could have a deleterious impact on our assumptions.

Management Profile (Source: www.xxiicentury.com.com)

Joseph Pandolfino, Chief Executive Officer

Mr. Pandolfino founded 22nd Century Limited, LLC in 1998 and has over 15 years experience in all aspects of the tobacco industry, including 12 years with genetically-engineered tobacco. He served as our President since our inception and as our Chief Executive Officer since April 2010. Mr. Pandolfino oversees our operations, strategy and product development. Mr. Pandolfino holds a Bachelor of Science Degree in Business Administration from Medaille College and a Master of Business Administration Degree from the State University of New York at Buffalo.

Henry Sicignano III, President & Secretary

Mr. Sicignano has served as our President since April, 2010. From August 2005 to April 2009, Mr. Sicignano served as a General Manager and as the Director of Corporate Marketing for NOCO Energy Corp., a petroleum products company; and from March 2003 to July 2005, as Vice President of Kittinger Furniture Company, Inc., a fine furniture manufacturer. From February 1997 through July 2002, he served as Vice President and Marketing Director of Santa Fe Natural Tobacco Company, a specialty tobacco company, prior to the sale of that company to R.J. Reynolds Tobacco Company for $356 million in 2002. Mr. Sicignano holds a Bachelors of Arts Degree in Government from Harvard College and a Master of Business Administration Degree from Harvard University.

Michael Moynihan, Ph.D., Vice President of R&D

Dr. Moynihan has served as our Vice President of R&D since 2007 and as a consultant for us since 1999. From 2001 to 2006 he served as Director of Biotechnology Development at Fundación Chile and from 1995 to 2000 as Senior Project Director at InterLink Biotechnologies LLC. He previously served as a Visiting Research Fellow at the Institute for Molecular and Cellular Biology, Osaka University, Japan; a Postdoctoral Associate in the Section of Plant Biology, Cornell University; and a Postdoctoral Associate at the Center for Agricultural Molecular Biology, Rutgers University. Dr. Moynihan holds a Bachelor of Science Degree in Biology from Brown University and a Master's Degree and Ph.D. in Biology from Harvard University.

John T. Brodfuehrer, Chief Financial Officer

Mr. Brodfuehrer was appointed our Chief Financial Officer in March 2013. Through December 2012, Mr. Brodfuehrer served as the Chief Financial Officer of Latina Boulevard Foods, LLC, or LBF, an entity formed as the result of a merger of two long-time Western New York wholesale food distributors. Prior to his employment with LBF, Mr. Brodfuehrer was Vice-President of Retail Accounting for United Refining Company, or URC. Prior to his time at URC, Mr. Brodfuehrer served in multiple roles over a twenty-four year span with NOCO Energy Corp, a diversified distributor of energy products and related services. Mr. Brodfuehrer served as NOCO's Chief Financial Officer, Vice-President and as a member of the Board of Directors from 2000 to 2009. Mr. Brodfuehrer earned a Bachelor of Science in Business Administration, summa cum laude, from the State University of New York at Buffalo in 1979 and became a New York State Certified Public Accountant in 1981.

Companies Mentioned In This Report

1. Altira (MO- $37.25 – NR)
2. British American Tobacco (LSE:BATS- £31.12 – NR)
3. Lorillard (LO- $49.16 – NR)
4. Pfizer (PFE- $30.93 – Buy)
5. Reynolds American (RAI- $48.51 – NR)
6. Vapor Corp. (VPCOD - $8.85 – NR)
7. Victory Electronic Cigarettes (ECIG- $9.65 – NR)

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

	2012	Q1 13	Q2 13	Q3 13	Q4 13 E	2013 E	Q1 14 E	Q2 14 E	Q3 14 E	Q4 14 E	2014 E	2015 E
Revenue	19	0	0	53	6,811	6,864	450	250	2,750	3,500	6,950	15,250
Cost Of Goods Sold	68	0	0	21	113	133	225	125	625	1,000	1,975	5,625
Gross Profit	(49)	0	0	32	6,699	6,730	225	125	2,125	2,500	4,975	9,625
R&D	729	191	165	143	175	674	250	400	400	400	1,450	1,800
G&A	2,205	1,148	1,401	908	1,200	4,657	1,500	1,500	1,500	1,500	6,000	6,600
Sales & marketing	62	0	0	4	25	29	150	250	250	250	900	1,400
Depreciation & Amort.	198	53	57	64	64	237	125	125	125	125	500	600
Opex	3,195	1,392	1,623	1,119	1,464	5,596	2,025	2,275	2,275	2,275	8,850	10,400
Operating Income	(3,244)	(1,392)	(1,623)	(1,087)	5,235	1,134	(1,800)	(2,150)	(150)	225	(3,875)	(775)
Interest Expense	(1,495)	(106)	(82)	(558)	(60)	(805)	(2)	(2)	(2)	(2)	(8)	(8)
Warrant Charge	(1,998)	(1,016)	1,259	(13,728)	(9,400)	(22,886)	0	0	0	0	0	0
Pretax Income	(6,737)	(2,513)	(446)	(15,373)	(4,225)	(22,557)	(1,802)	(2,152)	(152)	223	(3,883)	(783)
Income Tax Expense	0	0	0	0	0	0	0	0	0	0	0	0
Net before Minority Interest	(6,737)	(2,513)	(446)	(15,373)	(4,225)	(22,557)	(1,802)	(2,152)	(152)	223	(3,883)	(783)
Minority Interest	1	1	0	0	0	1	0	0	0	0	0	0
Net to Common	(6,735)	(2,512)	(446)	(15,373)	(4,225)	(22,555)	(1,802)	(2,152)	(152)	223	(3,883)	(783)
Shares	30,420	36,306	39,794	47,390	51,750	43,810	57,000	57,500	58,000	58,500	57,750	59,750
EPS	($0.22)	($0.07)	($0.01)	($0.32)	($0.08)	($0.51)	($0.03)	($0.04)	($0.00)	$0.00	($0.07)	($0.01)

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

	2012	2013 E	2014 E	2015 E	2016 E	2017 E	2018 E	2019 E	2020 E	2021 E
Revenue	19	6,864	6,950	15,250	20,361	31,542	47,813	71,220	105,330	137,318
Cost Of Goods Sold	68	133	1,975	5,625	9,181	14,271	21,407	32,110	48,165	63,159
Gross Profit	(49)	6,730	4,975	9,625	11,181	17,271	26,407	39,110	57,165	74,159
R&D	729	674	1,450	1,800	2,000	2,300	2,645	3,042	3,498	4,023
G&A	2,205	4,657	6,000	6,600	7,260	7,986	8,785	9,663	10,629	11,692
Sales & marketing	62	29	900	1,400	2,000	3,000	4,500	5,625	6,469	7,116
Depreciation & Amort.	198	237	500	600	700	770	847	932	1,025	1,127
Opex	3,195	5,596	8,850	10,400	11,960	14,056	16,777	19,262	21,621	23,958
Operating Income	(3,244)	1,134	(3,875)	(775)	(779)	3,215	9,630	19,848	35,544	50,201
Interest Expense	(1,495)	(805)	(8)	(8)	(8)	(8)	(8)	(8)	(8)	(8)
Warrant Charge	(1,998)	(22,886)	0	0	0	0	0	0	0	0
Pretax Income	(6,737)	(22,557)	(3,883)	(783)	(787)	3,207	9,622	19,840	35,536	50,193
Income Tax Expense	0	0	0	0	(276)	1,122	3,368	6,944	12,438	17,568
Net before Minority Interest	(6,737)	(22,557)	(3,883)	(783)	(512)	2,085	6,254	12,896	23,098	32,626
Minority Interest	1	1	0	0	0	0	0	0	0	0
Net to Common	(6,735)	(22,555)	(3,883)	(783)	(512)	2,085	6,254	12,896	23,098	32,626
Shares	30,420	43,810	57,750	59,750	61,750	63,750	65,750	67,750	69,750	71,750
EPS	($0.22)	($0.51)	($0.07)	($0.01)	($0.01)	$0.03	$0.10	$0.19	$0.33	$0.45

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

	2012	Q1 13	Q2 13	Q3 13	Q4 13 E	2013 E	2014 E	2015 E	2016 E
Cash	0	279	452	1,036	5,862	5,862	3,426	6,013	7,963
Grant Receivable	0	0	0	0	0	0	0	0	0
Due from relaed party and officers	41	46	47	48	48	48	0	0	0
A/R	0	0	0	0	0	0	1,644	2,466	4,418
Inventory	1,231	1,231	1,257	1,288	1,288	1,288	1,821	2,232	3,207
Prepaid Exp.	10	49	33	23	23	23	101	151	271
Total Current Assets	**1,281**	**1,605**	**1,789**	**2,395**	**7,221**	**7,221**	**6,992**	**10,862**	**15,860**
Patent and Trademark costs	1,353	1,339	1,345	1,419	1,419	1,419	1,174	929	684
PP&E	6	28	28	26	3,183	3,183	3,253	3,052	2,780
Deferred Costs	4	0	0	0	0	0	0	0	0
Total Assets	**2,645**	**2,972**	**3,161**	**3,840**	**11,823**	**11,823**	**11,419**	**14,843**	**19,323**
Bank Loans and N/P	2,686	1,368	1,423	1,251	175	175	175	175	175
A/P	1,411	212	423	510	510	510	721	884	1,270
Accrued Interest	4	4	10	15	0	0	0	0	0
Accrued Expenses	503	224	330	140	140	140	198	242	348
Preferred Stock Dividend Payable	0	52	93	0	0	0	0	0	0
Market make-good liability	0	0	0	290	290	290	0	0	0
Total Current Liabilities	**4,603**	**1,861**	**2,279**	**2,207**	**1,115**	**1,115**	**1,094**	**1,301**	**1,793**
Long-Term Debt	0	175	175	0	0	0	0	0	0
Warrant Liability	4,173	8,669	7,918	18,638	1,200	1,200	1,200	1,200	1,200
Shareholder's Equity	(6,131)	(7,733)	(7,210)	(17,004)	9,508	9,508	9,125	12,342	16,331
Minority Interest	0	0	0	0	0	0	0	0	0
Total Liabilities And Equity	**2,645**	**2,972**	**3,162**	**3,840**	**11,823**	**11,823**	**11,419**	**14,843**	**19,323**

	2012	Q1 13	Q2 13	Q3 13	Q4 13 E	2013 E	2014 E	2015 E	2016 E
Net Income	(6,737)	(2,513)	(446)	(15,373)	(4,225)	(22,557)	(3,883)	(783)	(512)
Depreciation & Amort.	198	52	57	64	64	237	875	946	1,018
Stock Comp	808	874	39	34	300	1,246	1,500	2,000	2,500
Other	3,866	1,183	(269)	14,550	9,400	24,864	0	0	0
Working Capital	100	(733)	249	(190)	(15)	(690)	(2,228)	(1,076)	(2,555)
Operating Cash Flow	(1,764)	(1,137)	(370)	(916)	5,523	3,100	(3,737)	1,087	450
Acquisition of Patents and trademarks	(163)	(15)	0	(56)	0	(70)	0	0	0
Capx	0	(14)	(0)	(8)	(3,220)	(3,242)	(700)	(500)	(500)
Investing Activities	(163)	(29)	(0)	(64)	(3,220)	(3,313)	(700)	(500)	(500)
Debt	225	(585)	0	(148)	(1,076)	(1,809)	0	0	0
Equity	1,468	2,035	544	1,713	3,600	7,891	2,000	2,000	2,000
Other	(17)	(6)	(1)	(1)	0	(7)	0	0	0
Financing Activities	1,675	1,444	543	1,563	2,524	6,074	2,000	2,000	2,000
Change in Cash	(252)	278	173	584	4,827	5,862	(2,437)	2,587	1,950

Important Research Disclosures

Distribution of Ratings/IB Services
Chardan Capital Markets

Rating	Count	Percent	IB Serv./Past 12 Mos. Count	IB Serv./Past 12 Mos. Percent
BUY [BUY]	28	80.00	8	28.57
HOLD [NEUTRAL]	7	20.00	1	14.29
SELL [SELL]	0	0.00	0	0.00
NOT RATED [NR]	0	0.00	0	0.00

Regulation Analyst Certification ("Reg AC") — JAMES McILREE, CFA

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