

Chemical Product Design

Pitching

Now: **Group Red**

Gets ready: **Group Blue**

23.12.2021

Odorless Recycling of Compost Trash



Brian Petrus
Fan Zhiyuan
Ghali Sekkat
Nicola Hagger
Thomas Schaer

23.12.2021
ETH Hönggerberg, Zürich

Does your compost smell bad?

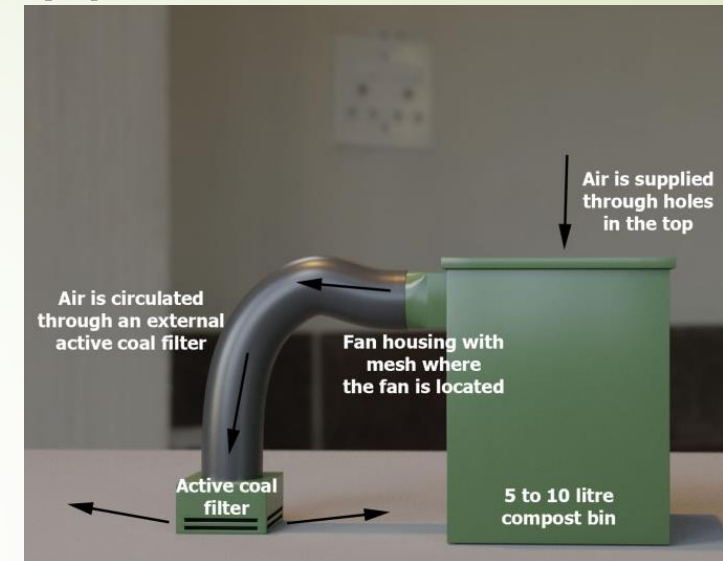
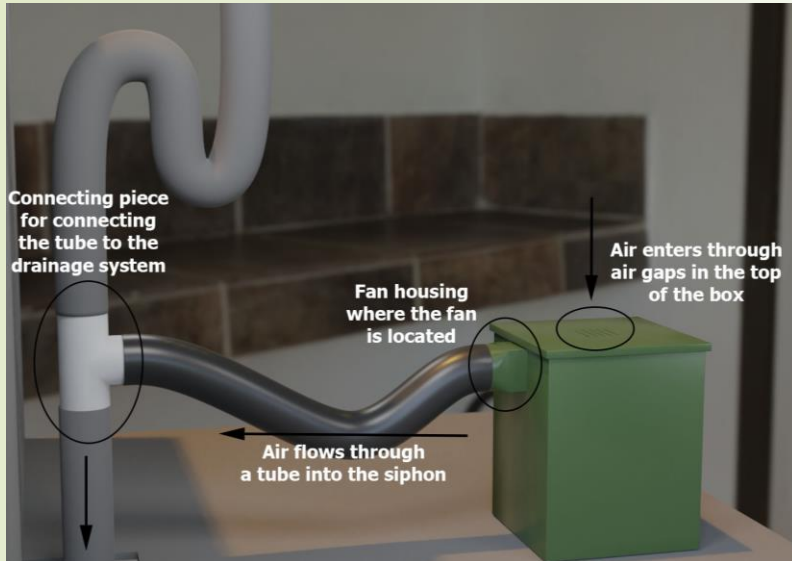
[https://www.youtube.com/
watch?v=ep0gCXI0La8](https://www.youtube.com/watch?v=ep0gCXI0La8)

Vision and Value Proposition

- Make composting easier
 - ...by reducing the odor of compost trash
- Reduce the amount of household trash
 - ...by increasing composting adoption
- Benefit the environment
 - ...by turning compost trash into resource



Solution and Prototype



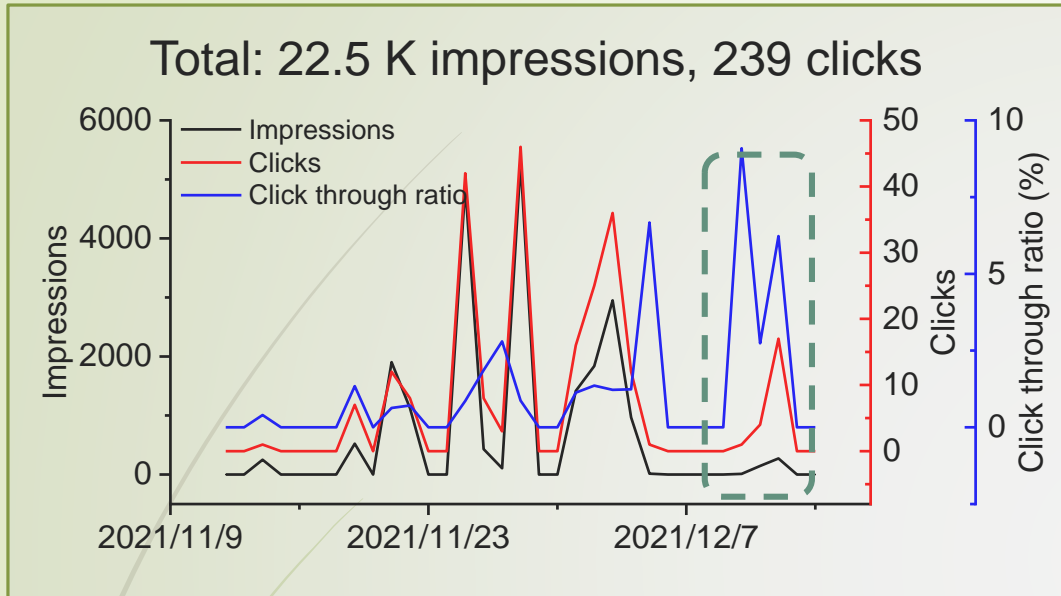
- Two solutions were tested:
 - Vent air through active carbon filter
 - Vent air to drainage system
- Proof of concept for both solutions
 - Active carbon filter has to be replaced from time to time (200 g/week)
 - Drainage connection has to be optimized



Market Research and Target Market

WordPress Google Ads Google Analytics

<https://compostsolution.wpcomstaging.com/>



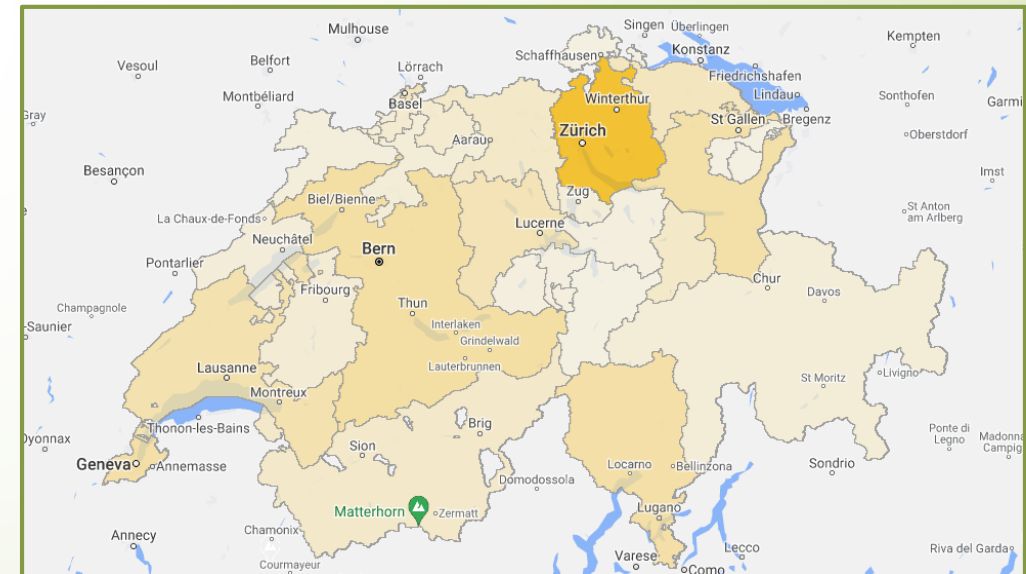
Ad	Ad 1	Ad 2	Ad 3
Impressions	139	125	199
Clicks	6	3	13
CTR (%)	4.8	2.16	6.53
Average time spent on the website (s)	N/A	159	27
Optimization score (%)	99	99	99

- Ad 1 Ad · compostsolution.wpcomstaging.com/

Give you a smell-free kitchen | Swiss-made compost bin | BIOVENT
Easy, Cheap and effortless device to solve the smell problems of your compost. Troubles with the smell of your compost trash ? Not anymore with BIOVENT.
- Ad 2 Ad · compostsolution.wpcomstaging.com/

Compost recycling system | BIOVENT | Made in Switzerland
Cheap, easy to use, and reduces the smell. Do you have smell problems with your compost? Use our device BIOVENT.
- Ad 3 Ad · compostsolution.wpcomstaging.com/

Ecofriendly lifestyle | BIOVENT | Compost recycling bin
With BIOVENT, compost recycling is enjoyable no smell issues. Start recycling, and turn more trash into resource with BIOVENT!



Customer Response/Validation

[BioVent] Contact

Sehr geehrtes Biovent Team, Ihre Werbung ist in meinem Postkasten gelandet und daher kontaktiere ich Sie. Ich bin Rebecca Ragaz, Chefredaktorin beim Verlag B2B Swiss Medien AG. Ich bin zuständig für das Magazin Chemie Pharma Innovation und habe in der kommenden Ausgabe (Februar 2022) noch Platz für Produktneuheiten. Möchten Sie auf einer Seite im Print (max. 4000 Zeichen, 1-2 Bilder - jpg, 300 dpi) über Ihr Produkt/Team berichten? Ich würde mich freuen, wenn das klappt. Freundliche Grüsse
Rebecca Ragaz

Spam

Trash



<https://www.chemiepharma-innovation.ch/>

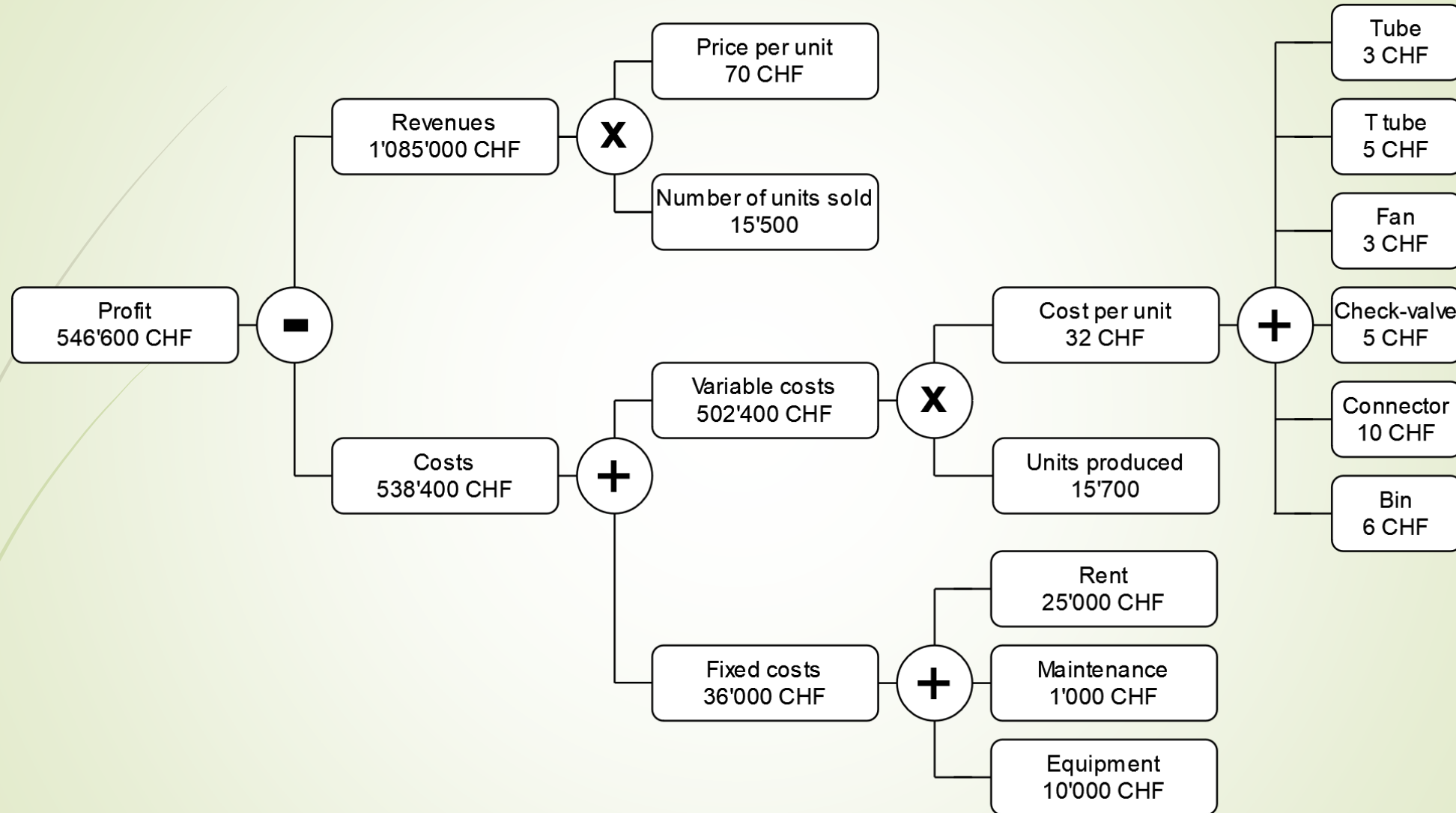
Technical suggestions from the customers:

- Use H₂S instead of CO₂ in the experiments;
- Install a check valve;
- Optimize the size of the active carbon filter;
- The lifetime of the product should be specified, as the fan becomes less powerful over time.

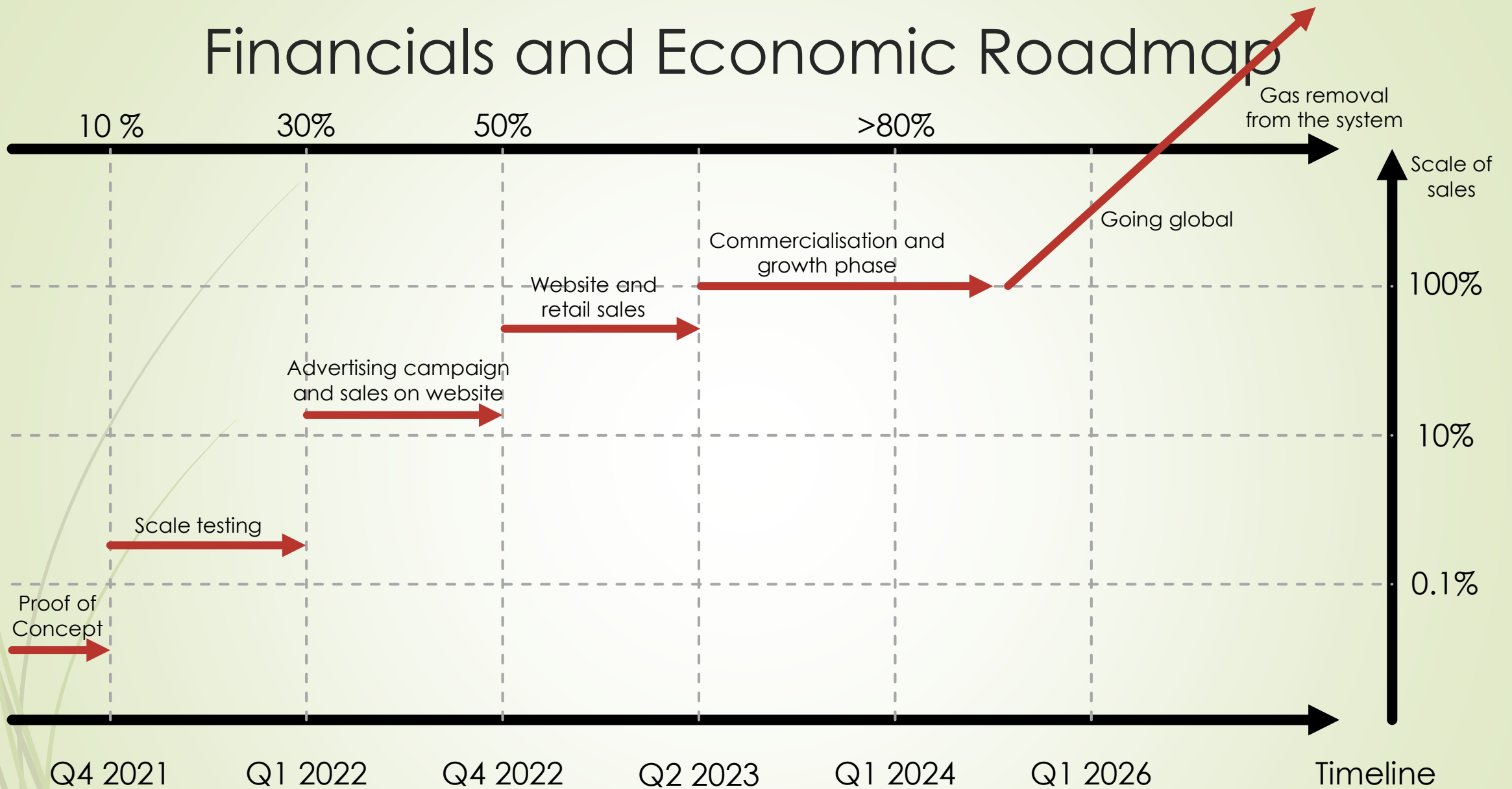
Questionnaire responses from the customers:

- Would you buy a BioVent?
 - 6 x yes, 3 x maybe, 7 x no.
- Which model is your preferred one?
 - 7 x drain modification, 1 x internal circulation, 5 x external circulation, 3 x no preference.
- What do you think about the price of the models?
 - 1 x too low, 10 x reasonable, 5 x too high.
- What do you like the most about BioVent?
 - 9 x design and looks, 4 x removal of odors, 3 x nothing in particular.
- What do you like the least about BioVent?
 - 4 x not necessary, 4 x energy consumption for ventilator, 6 x difficult application (especially the drain modification), 2 x price.

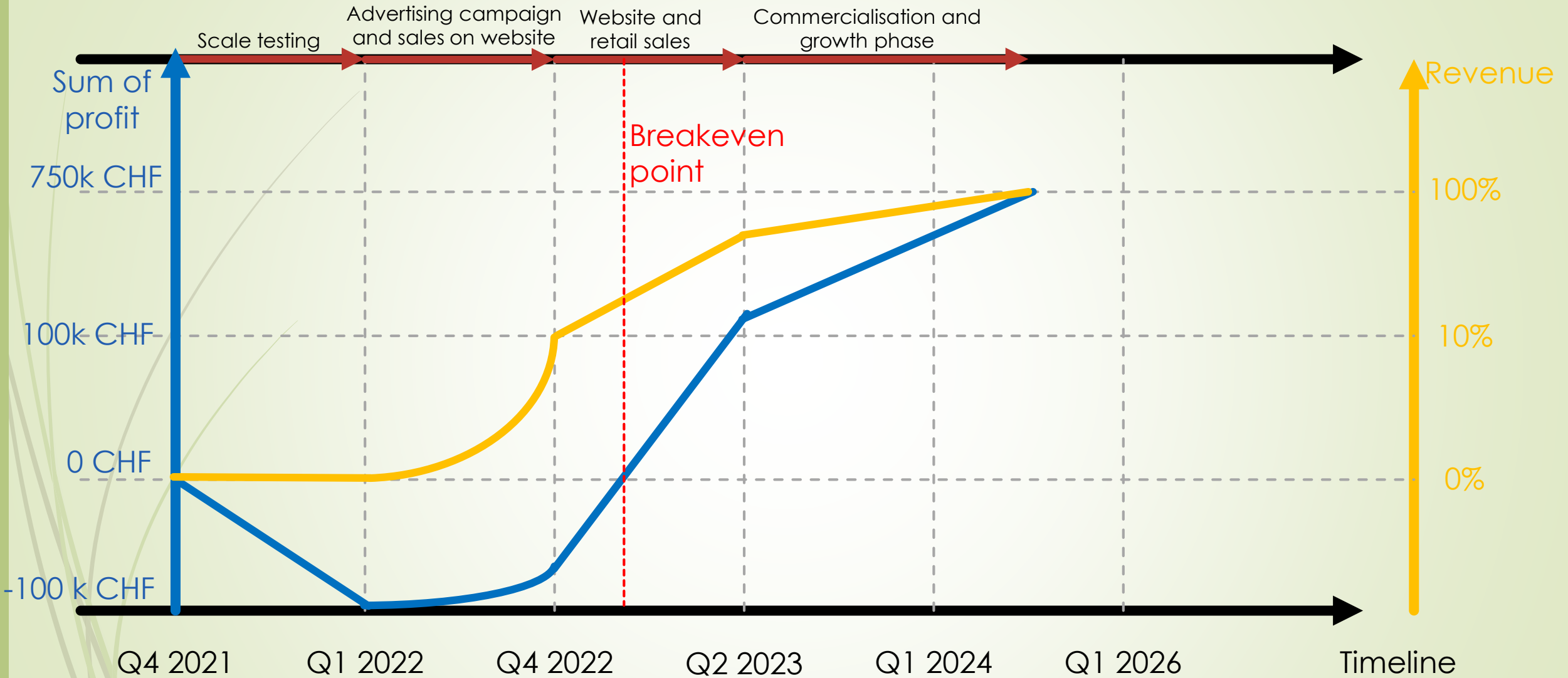
Financials and Economic Roadmap



Financials and Economic Roadmap



Investment and Timeline



Thank you for your attention

BIOVENT

Chemical Product Design

Pitching

Now: **Group Blue**

Gets ready: **Group Green**

23.12.2021

Group Blue: Optical Coatings

Giorgio Belleri, Alvaro Garcia, Dmitriy Pivovarov, Alexander Schoch

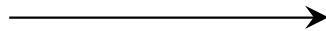
December 23, 2021



Our Vision



Problem



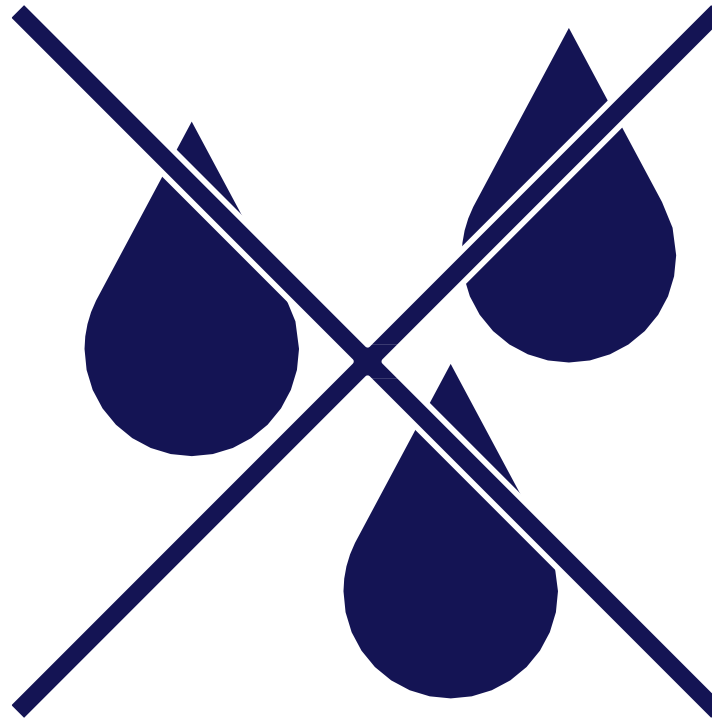
Solution



Value Proposition



Less Cleaning



Less Fogging



Less Grease



Group Blue
OPTICAL COATINGS

The Problem

Dirty

- Glasses permanently **dirty** and **smudgy**
- Consistent **cleaning routine** required
- Requires **carry-on** cleaning solution
- **Inefficient** and **unsatisfactory results** with conventional cleaning solutions



→ Anti-Sticking

Foggy

- Water vapor often **condenses** on glasses
- Especially in cold weather
- **Face masks** worn due to pandemic make problem more apparent



→ Anti-Fogging



Market

\$1.4B

Market for Prescription and Sun Glasses



Europe Market share of 1% to 5%



Life Span of 1y to 2y (without reapplication)

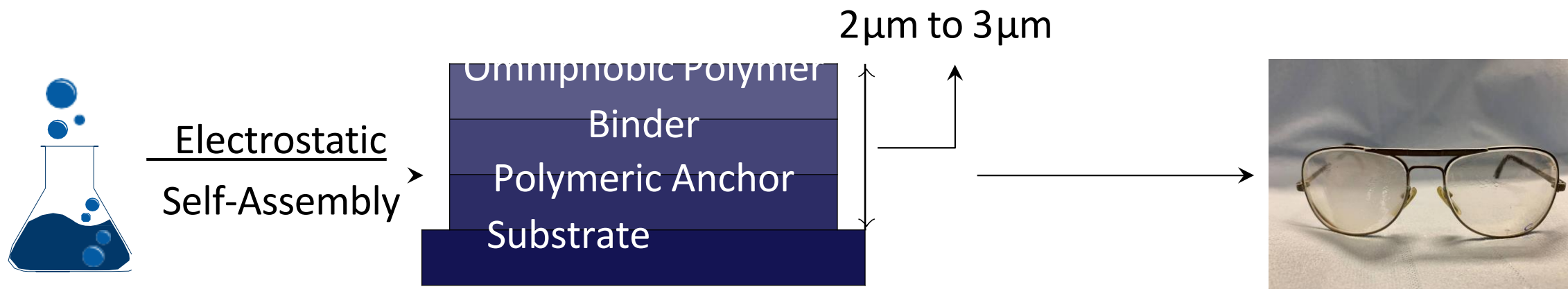


2.1M glasses coated per year, 260 glasses per hour

\$100M

Added feature like AR costs around 50CHF

Our Solution: OmniRep



Advantages: Product

- No carry-on
- Add-on option for glasses
- Transferrable to other applications

Advantages: Process

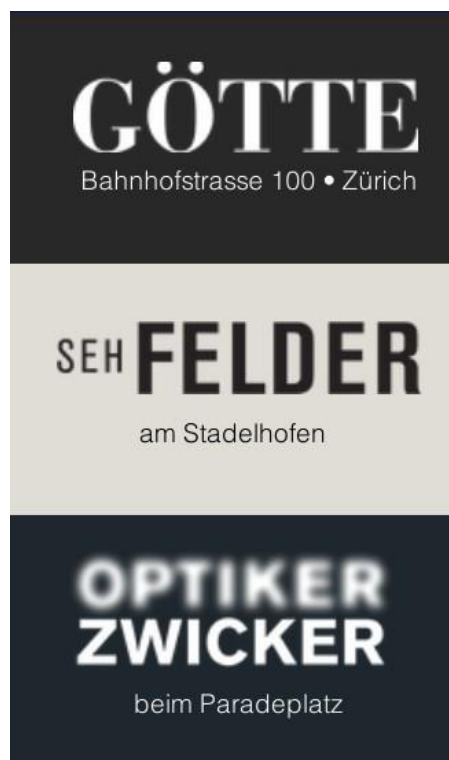
- Highly scalable
- Easily adaptable for size
- Simple and robust



Customer Validation

Positive feedback and confirmed interest from:

Opticians



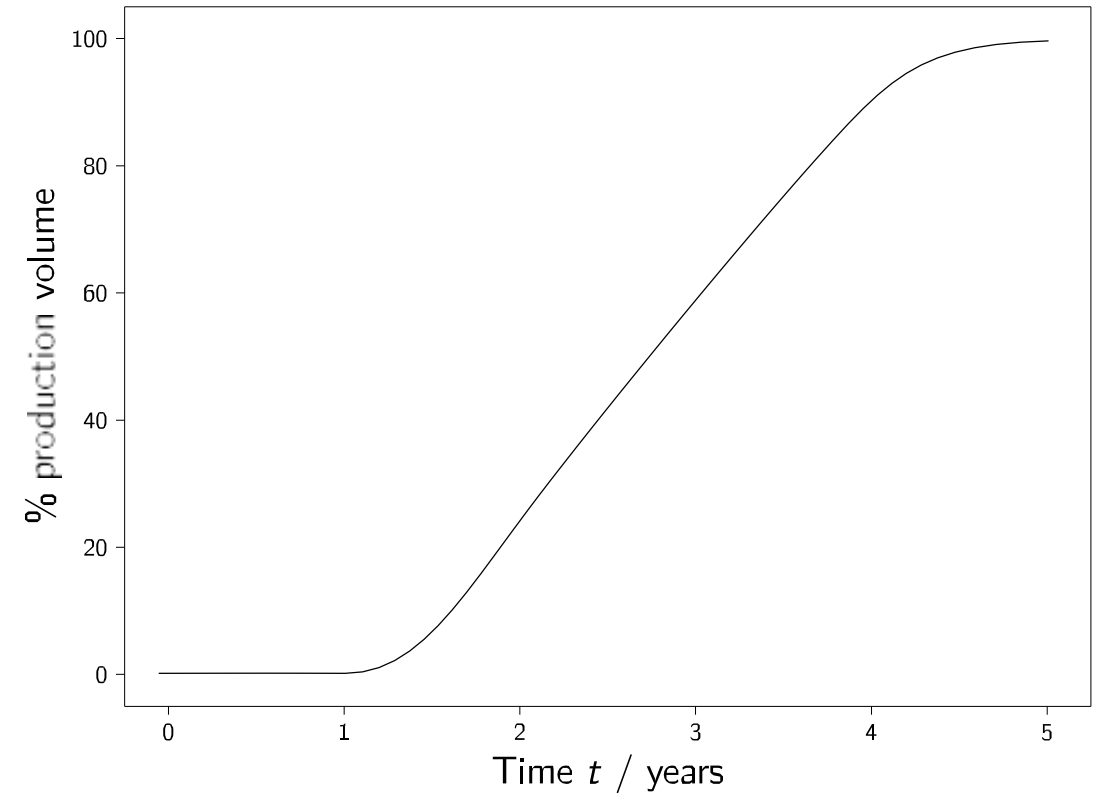
Lens Manufacturers



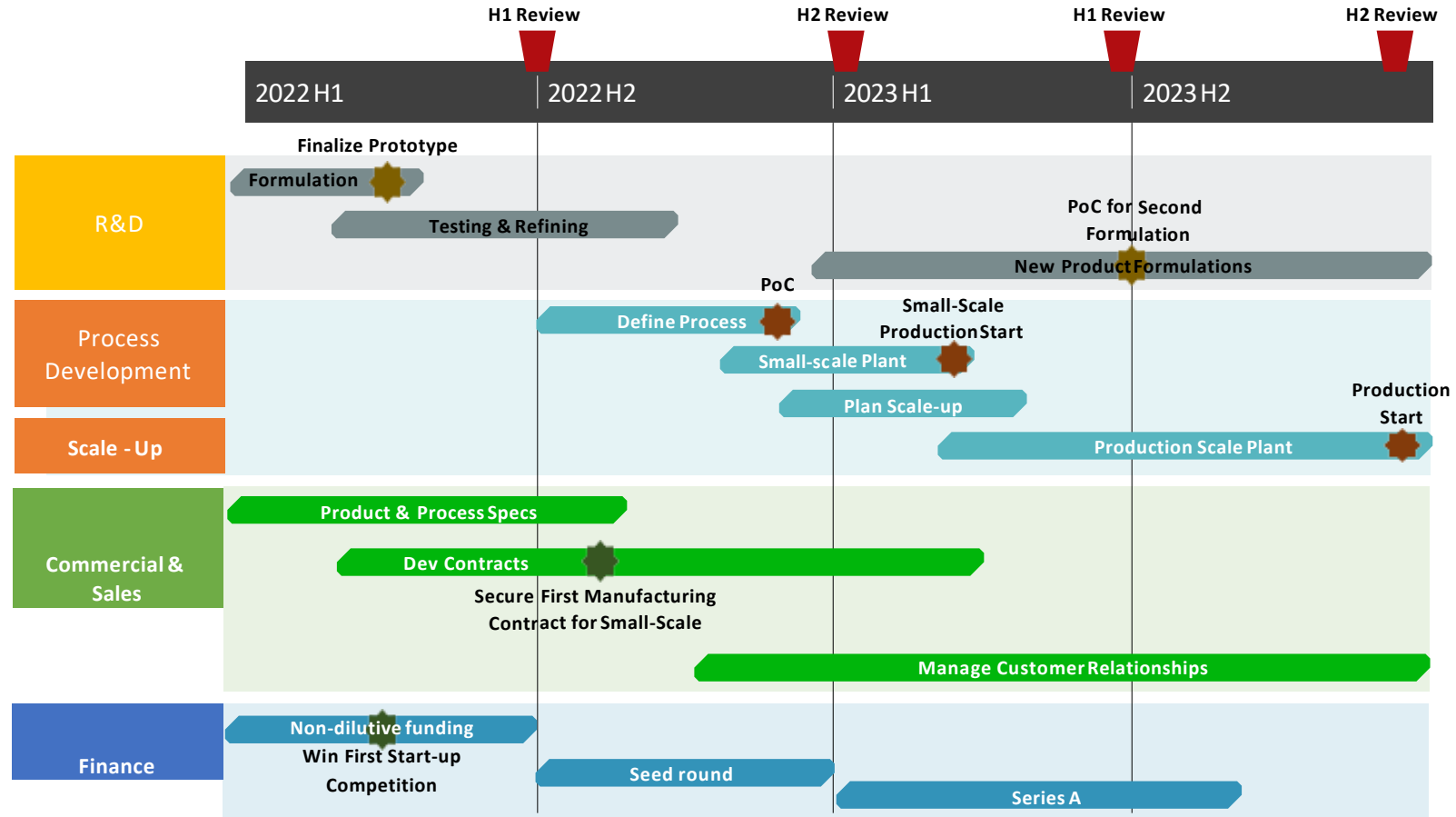
Finance

Full-Scale Production

- Coating 2.1M lenses per year
- Manufacturing cost: 4.30 CHF
- Investment cost: 11M CHF
- Selling price of 20CHF
- Break-even after 2y

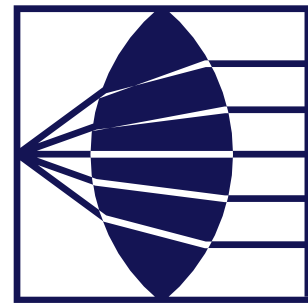


Roadmap



Investment

To make our vision a reality, we ask for 150kCHF for 15%



Group Blue
OPTICAL COATINGS

Let's be visionary
together!



Cost Estimation

Small-Scale Plant

Expense	Value
Equipment	25000CHF
Location (ETH)	12000CHFy ⁻¹
Chemicals	2400CHFy ⁻¹
Misc.	40000CHF
People	70000CHFy ⁻¹
Total	150000CHFy ⁻¹

Full Plant

Expense	Value
Mechanical System (x2)	350000CHF
EtOH Sprayer	400000CHF
Reactor	50000CHF
Water Sprayer	400000CHF
Continuous Dryer	100000CHF
Total	1650000CHF

Calculations (full scale)



ASSUMPTIONS

Fabrication cost, CHF \$/glasses

Constant	
Coating (RM: \$10.3/glasses)	4.30

Sales price, CHF \$/glasses

Constant	
OmniRep	20.00

Investment CHF \$10,948,800

Machinery and equipment	\$4139,520
Infrastructure and civil engineering	\$6209,280
Quality system	\$600,

Capacity

Installed capacity	2.1 M glasses/yr
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Market

Europe

Location

Germany

Production capacity (M glasses/year)

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Tendency
OmniRep		0.5	1.0	1.6	1.9	2.1	
		25.0%	50.0%	75.0%	90.0%	100.0%	

Financial results

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Tendency
Sales MM	-	10.4	20.8	31.2	37.5	41.6	
% Gross revenue		78.5%	78.5%	78.5%	78.5%	78.5%	
Direct cost MM	-	-	-	-	-	-	
Other expenses MM	-	0.2	0.3	0.4	0.5	0.5	
EBITDA MM	-	8.0	16.0	24.1	28.9	32.1	
% Ebitda Mg	0.0%	76.9%	77.1%	77.1%	77.2%	77.2%	
EBIT MM	-	6.9	14.9	22.9	27.8	31.0	
% Ebit Mg	0.0%	66.4%	71.5%	73.4%	74.1%	74.4%	
FCC, MM	10.95	600.0	-	-	-	-	
KW to invert, MM	-	3.5	3.5	3.5	2.1	1.4	
Cash Flow, MM	(10.9)	3.9	10.2	15.5	19.0	21.3	

Financial indicators

IRR	80.0%
NPV @ 12.5% proyecto	35.3
Contribution margin II	78.5%
Payback (year)	1.9



Group Blue
OPTICAL COATINGS

Revenue Estimation (Small-Scale)

Production

- 10 batches per production day
- 100 lenses per batch
- 1.4 work days per week
- 2.5 months of POC
- 14 000 coated lenses in the first year

Profit estimation

- Selling price of 20CHF
- Revenue of 140000CHF
- Break-even after 9 months + 4 months
- Forecast
 - ▶ Part-time production: yearly revenue of 1MCHF
 - ▶ Full-time production: yearly revenue of 5MCHF

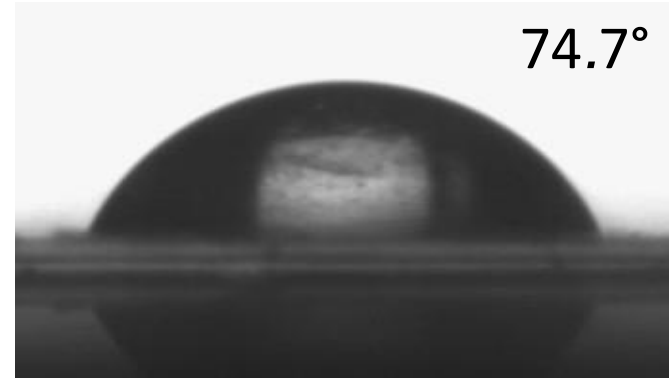


Contact Angle Measurements

Hexadecane



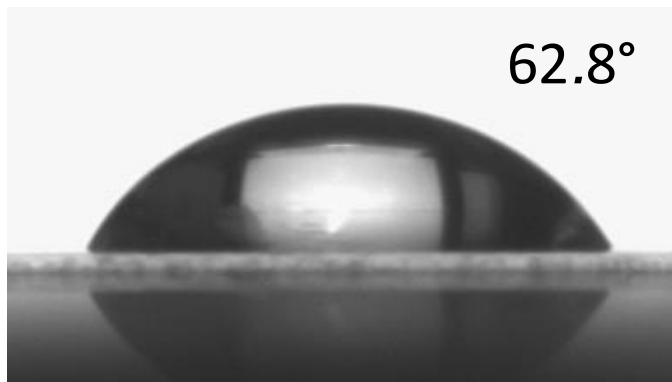
Reference



Coated

Oleophobicity ↑

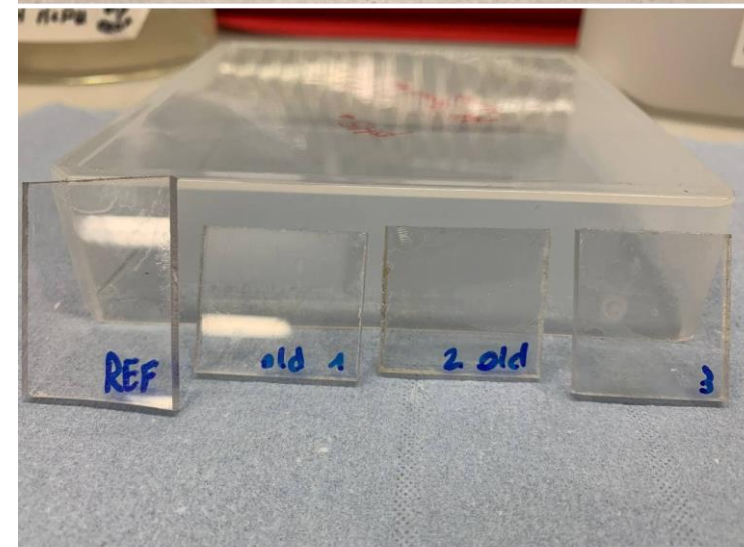
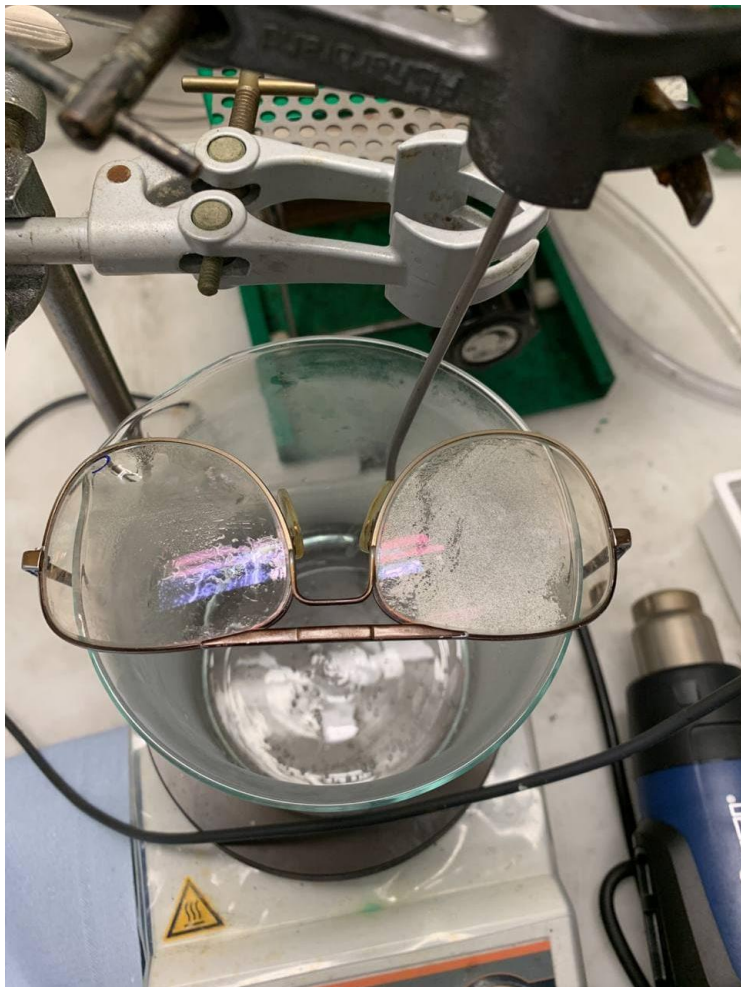
Water



Hydrophilicity ↑



Prototyping



Chemical Product Design

Pitching

Now: **Group Green**

Gets ready: **Group Yellow**

23.12.2021



N
B

NITROBOX

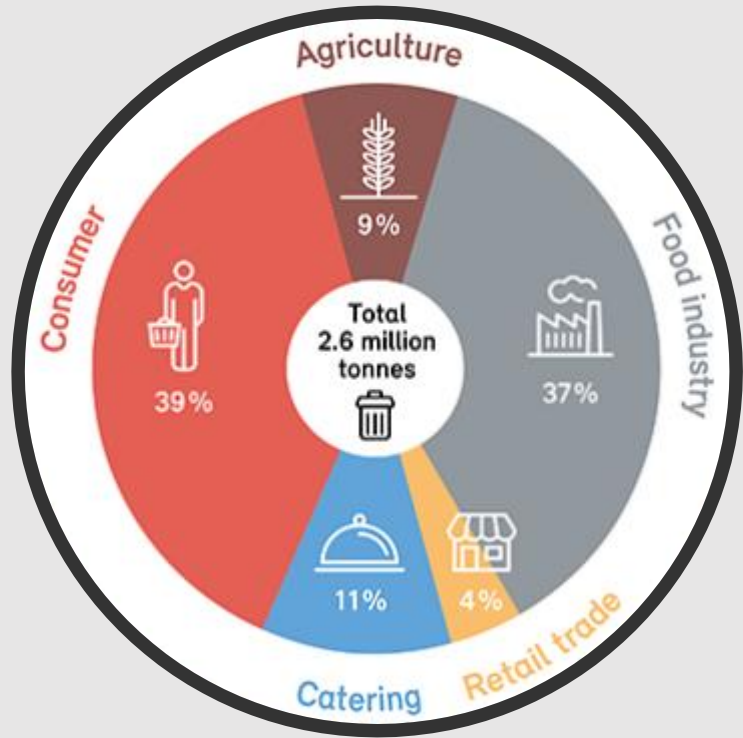
FOOD WASTE IS A BIG PROBLEM

**778'000
Tonnes/year**

**0.5 TONNES
OF CO2-EQ**

2.5 Bn CHF

HOUSEHOLDS ARE THE LARGEST CONTRIBUTORS



Main Reason: Food going bad early

70%

“Before Consumption”

91%

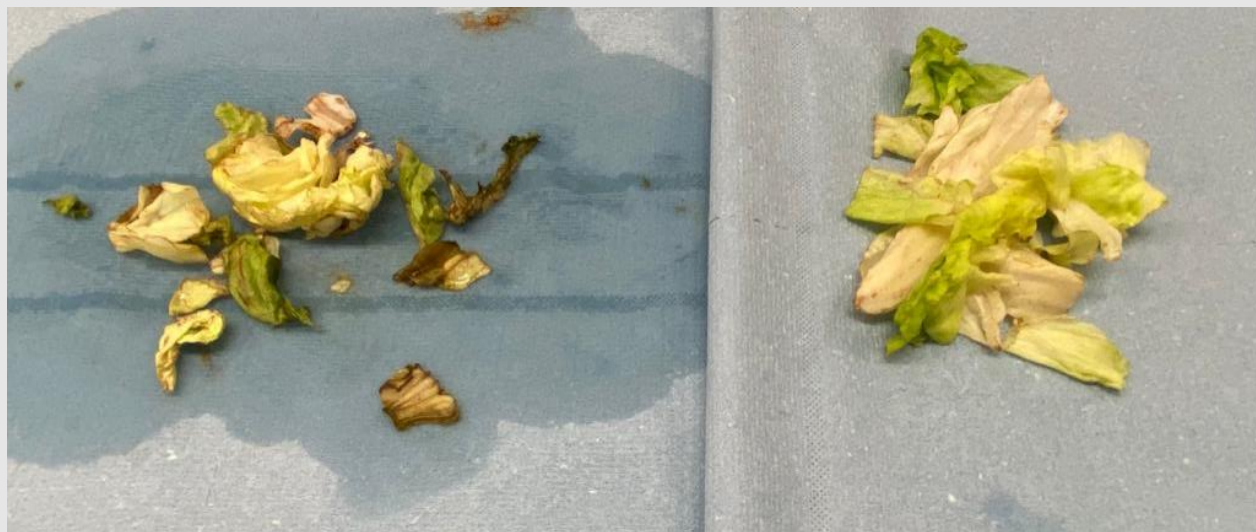
“Fruits rot”

79%

“Store more at home”



WHAT CAN WE DO ABOUT IT?



N
B

PROOF OF CONCEPT

AIR

NITROGEN

AIR

NITROGEN



3 Weeks

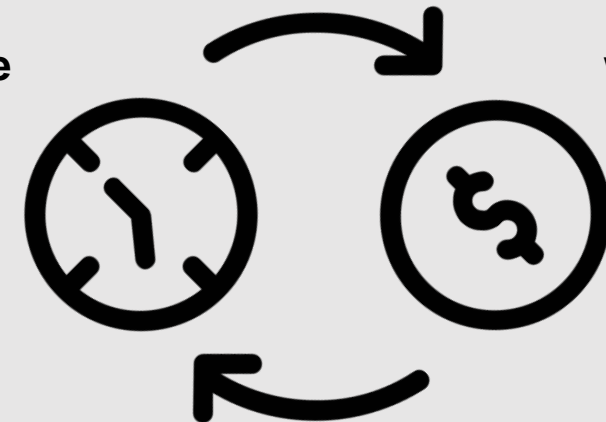


4°C

+1 week

Controlled Atmosphere Storage

**Stock up your
fridge and save
time**



**Combat food
waste and save
money**

OUR SOLUTION

>88.3% N₂

Nitrogen



Compact Design

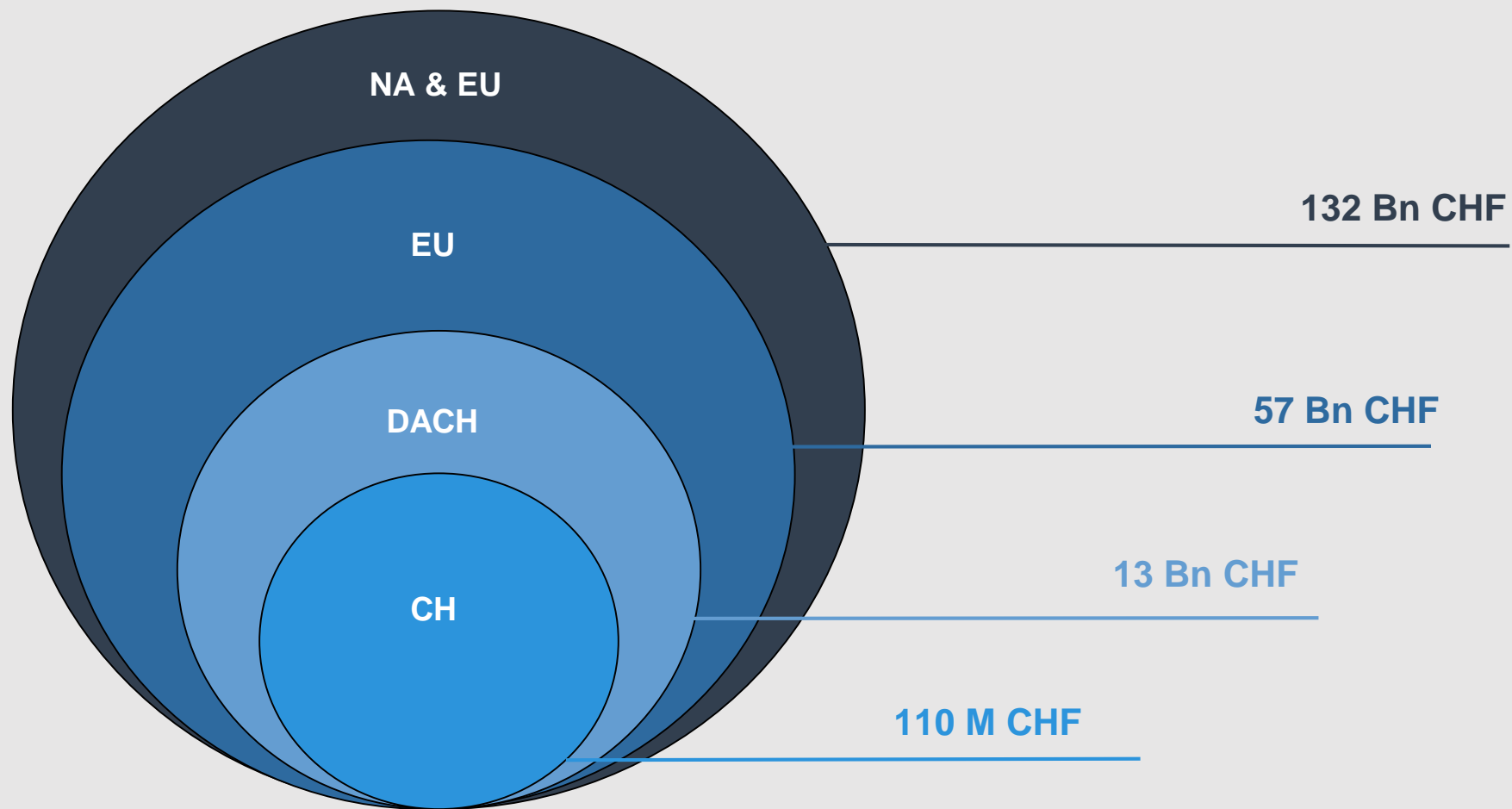


Sustainable Materials

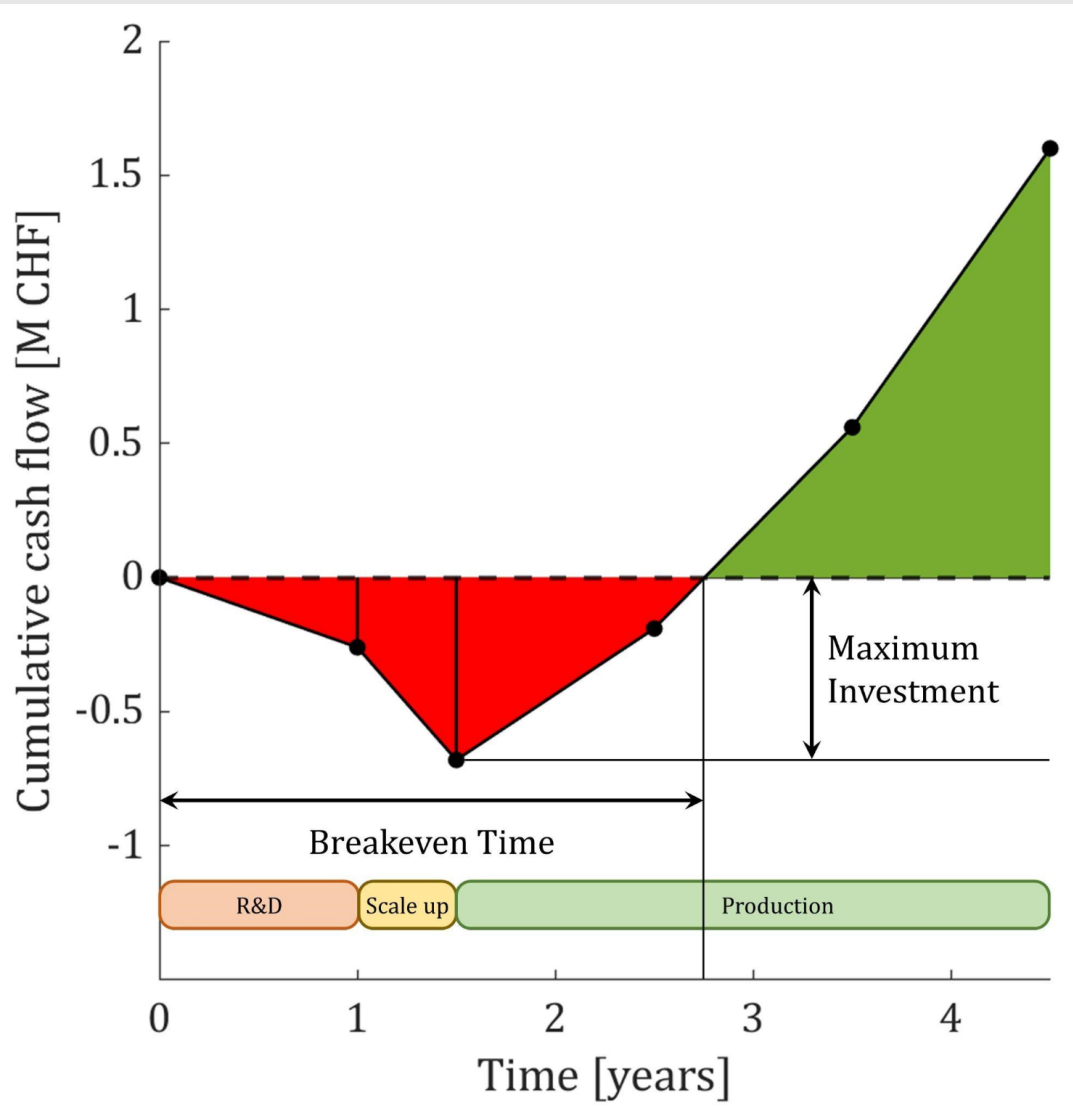
Low Energy
Consumption

Long Lifespan

MARKET SIZE



INITIAL MARKET



\$

700 000 CHF

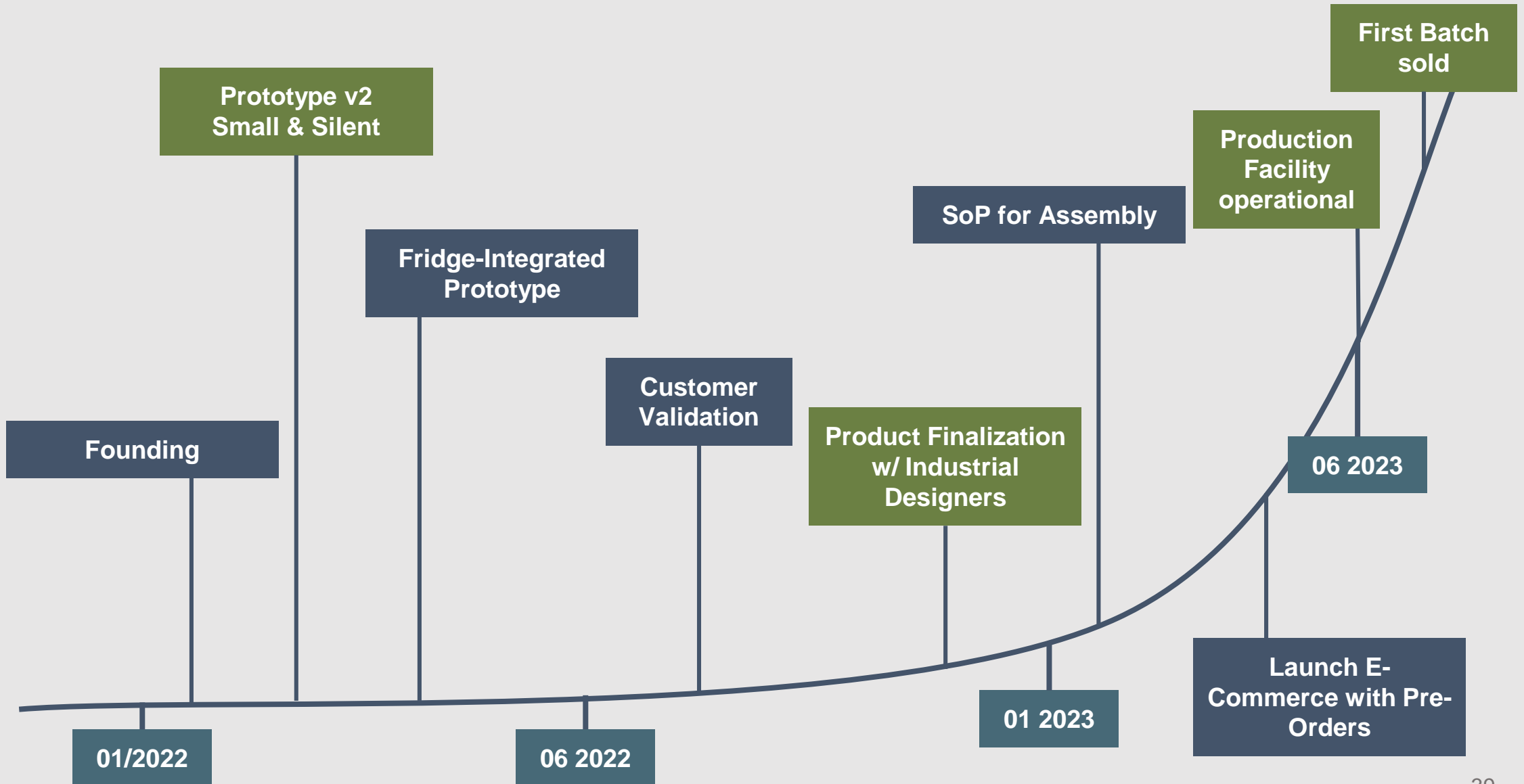


2% in CH after 36 Months



11 Months

ROADMAP



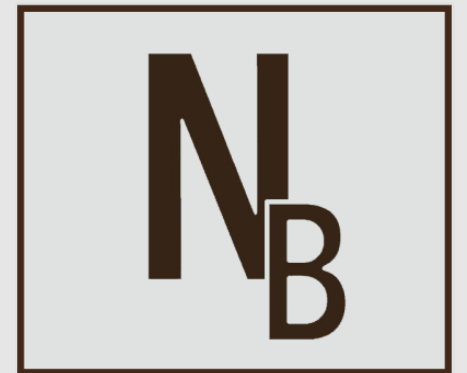
N_B

PRE SEED

800 000 CHF

10%

Nitrobox





GET IN TOUCH

NITROBOX TEAM

+41 78 735 21 10

swissnitrobox@gmail.com

www.nitrobox.ch

APPENDIX

PROTOTYPE SPECIFICATIONS

Nitrogen Purity	>88.3 %
Outlet flow rate [L/min]	50 L/min
Noise Level	Loud, > 60 db
-	-
Cartridge dimensions [cm]	28
Cartridge diameter [cm]	5
Power consumption [W]	120
Box dimensions [cm]	-
Box volume [l]	1.6
Filling time [s]	< 20

Element	Amount	Unit Price [CHF]	Price [CHF]	Source
Column Housing (RO Cartridge)	4x	0.5	2	https://www.alibaba.com/product-detail/Plastic-Ro-Housing-Membrane-Plastic-RO_60377811521.html?spm=a2700.galleryofferlist.normal_offer.d_image.33151993b1drYQ&sp=2way_1600122434517.html?spm=a2700.galleryofferlist.normal_offer.d_image.4062122f5zwwq
Solenoid Valve	1x	28	28	https://www.alibaba.com/product-detail/Festos-type-solenoid-valve-5-2way_1600122434517.html?spm=a2700.galleryofferlist.normal_offer.d_image.4062122f5zwwq
Valve	3x	4	12	https://www.alibaba.com/product-detail/High-pressure-precision-needle-valve-long_62282203633.html?spm=a2700.galleryofferlist.normal_offer.d_image.4062122f5zwwq
Timer	1x	7	7	https://www.amazon.de/ARCCELL-Speicher-Einstellbare-Schalter-Zeitverzögerung/dp/B07JKSRX5Y/ref=sas_ssr_111?tag=goog_hopde-21&linkCode=rdi&hvadid=427726927595&hvpos=&hvmw=&hvrand=3176107640570852336&hvpone=&hvpstwo=&hvqmt=&hvdv=&hvdvcmid=&hvlvcint=&hvlvcphy=1003297&hvtargid=pla-852746053428
Pneumatic Connector for Legris Tubes	6x	0.25	1.5	https://www.amazon.de/-/en/Pneumatic-Connectors-Fastenings-Connector-Connection/dp/B091HTLL7T/ref=sr_1_2?keywords=fitting+fur+legris+kunststoff&qid=1639345689&sr=8
Legris Tubing (CHF/meter)	2 meters	1	2	https://www.amazon.de/-/en/RUNCCI-YUN-Pneumatic-Connectors-Polyurethane-Compressed/dp/B08N1G1B8X/ref=sr_1_11?cid=A08860LHZS15&keywords=legris+pneumatik&qid=163845504&sr=8&tag=goog_hopde-21
Commercial Air Compressor	1x	7	7	https://www.alibaba.com/product-detail/Wholesale-dc-12v-air-compressor-digital_1600366245565.html?spm=a2700.galleryofferlist.normal_offer.d_image.790b73a5GqzHj
Zeolite Adsorbent (CHF/kg)	700 g	5	3.5	https://www.alibaba.com/product-detail/13x-Zeolite-Lithium-Oxygen-Concentrator-Zeolite_62127233570.html?spm=a2700.galleryofferlist.normal_offer.d_image.76206e2e03N9Fe&sp=2
Box/Container	1x	0.5	0.5	https://www.alibaba.com/product-detail/7-piece-airtight-stackable-food-containers_1600204073808.html?spm=a2700.galleryofferlist.normal_offer.d_image.49a2345ab0ASA
Total Cost			63.5	

- Selling Price: 130 CHF
- Production Cost (Equipment only) = approx 64 CHF (Assuming Economies of Scale)

FOOD WASTE IS A BIG PROBLEM

778'000 TONNES

amount of food waste generated by Swiss households every year
(28% of total food waste in Switzerland)

0.5 TONNE OF CO2 EQ

climate impact of avoidable food waste in Switzerland per person per year
(38% from households)

> 5'000'000'000 CHF

amount spent yearly by all households in Switzerland on avoidable food waste
(620 CHF per person)

~ 50% Confusion

contribution of fresh fruit and vegetables to the food waste generated by households in the EU

Chemical Product Design

Pitching

Now: **Group Yellow**

23.12.2021



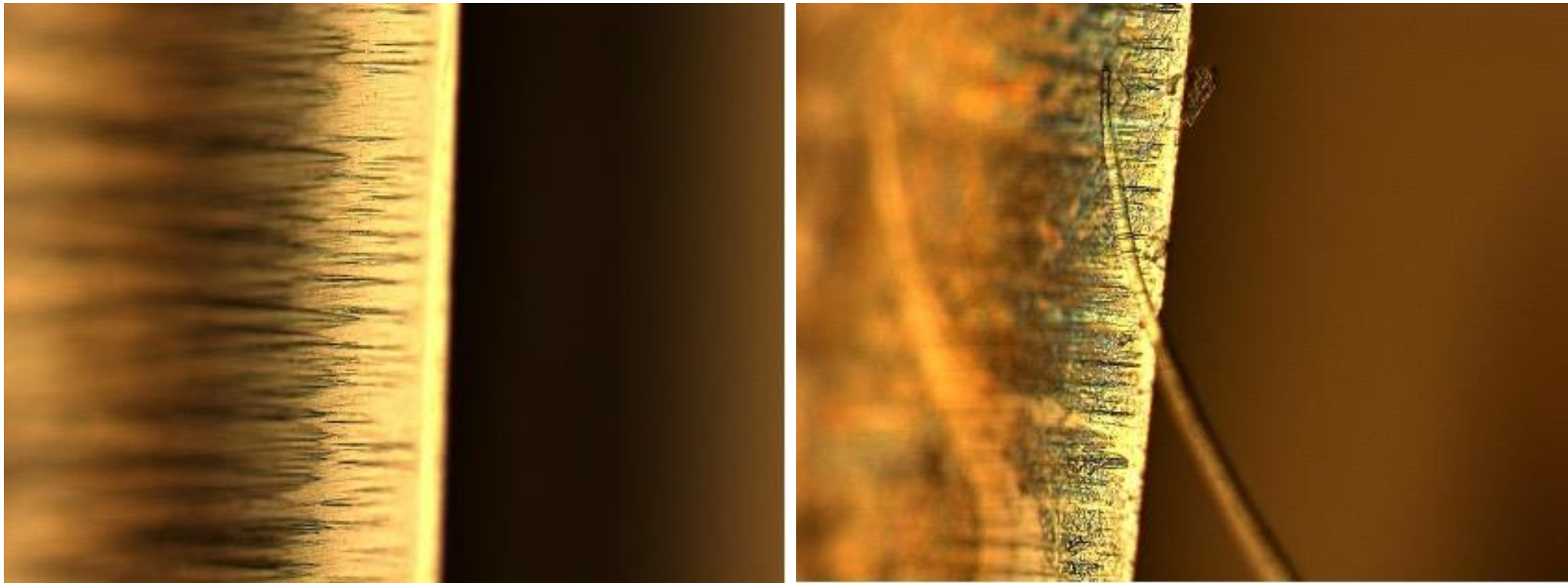
A cutting edge solution

Group Yellow

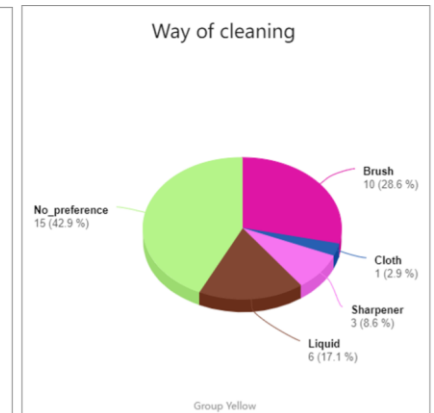
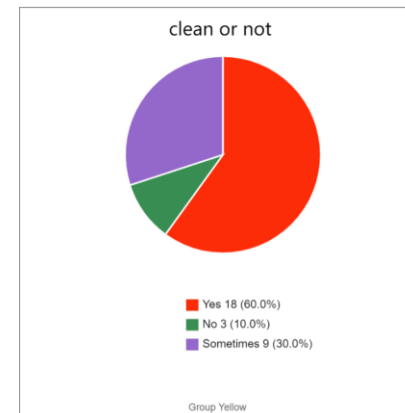
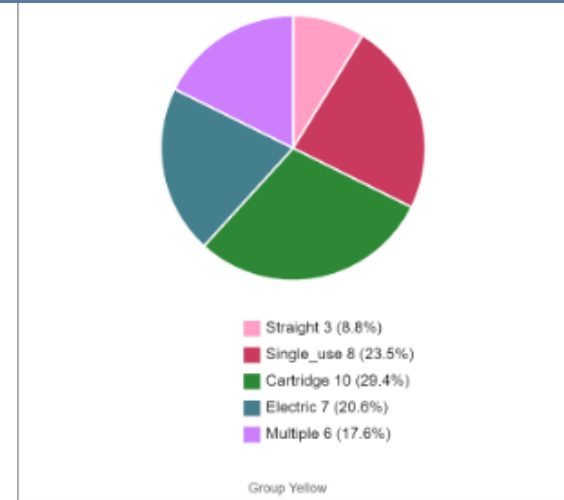
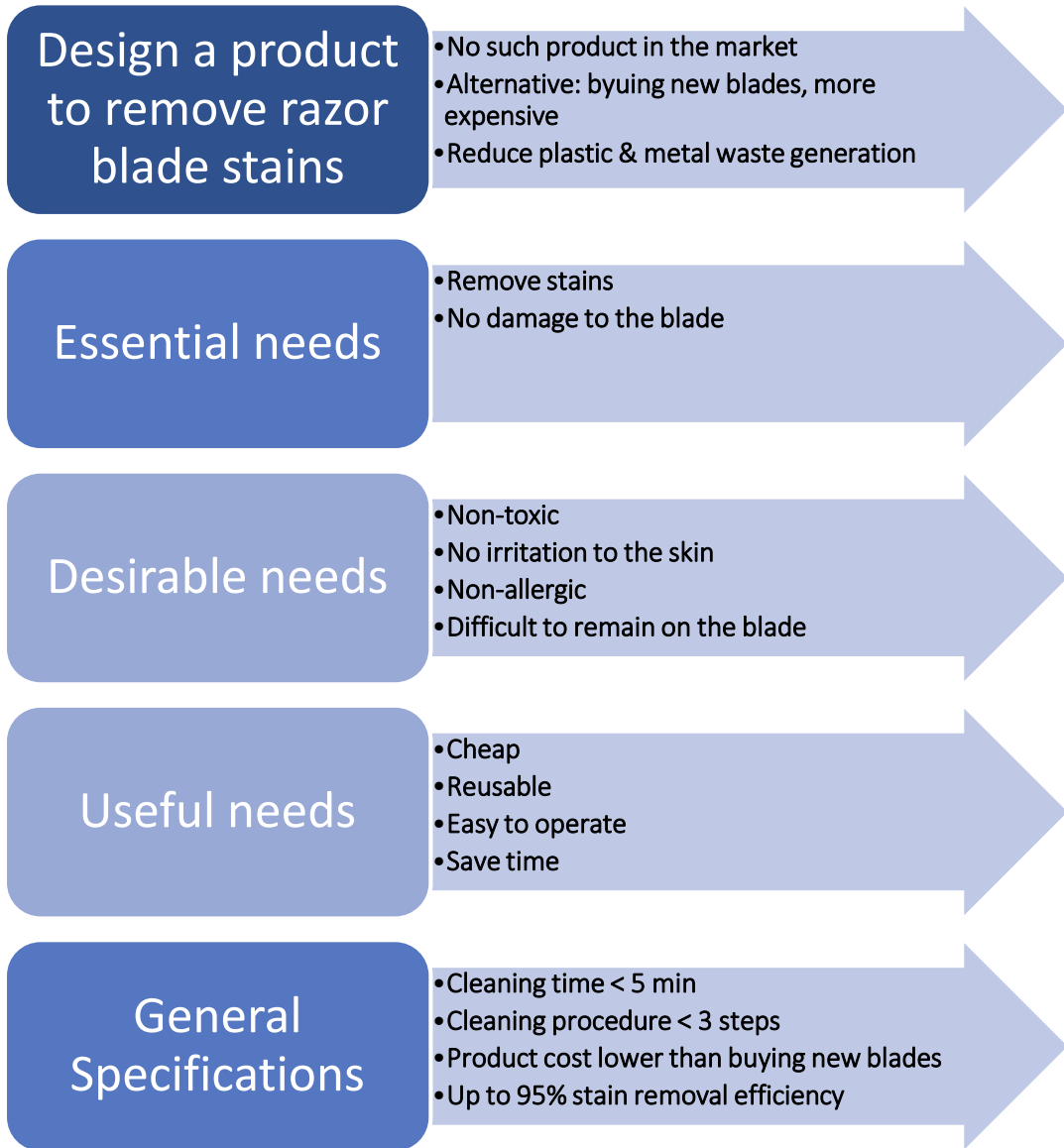
Problem to be solved

Razor blades have a use-time of a few shaves:

- Mineral & organic residue
- Oxidation of edges



Vision & Value Proposition



Market Research & Target Market

Global razor market

- \$10.2 Bio in 2018
- \$50 Bio by 2031
- CAGR ~7% over the next 10 years
- Electric shavers expected to seize 75% of the market

Global disposable razor blades market

- \$3.39 Bio in 2019
- \$4.31 Bio by 2027
- CAGR 3.2% in this period
- Up to 5 Tio disposable razors used globally
- Highly concentrated: P&G (Gillette), Edgewell Personal Care & BIC

Target Market

- Men over 16yo & women over 12yo
- People who think it is expensive to buy a new razors
- People who think the current methods for blade cleaning are troublesome.
- People who want to save time
- People who do not clean the blade (potential customers)

Prototypes

Prototype 1

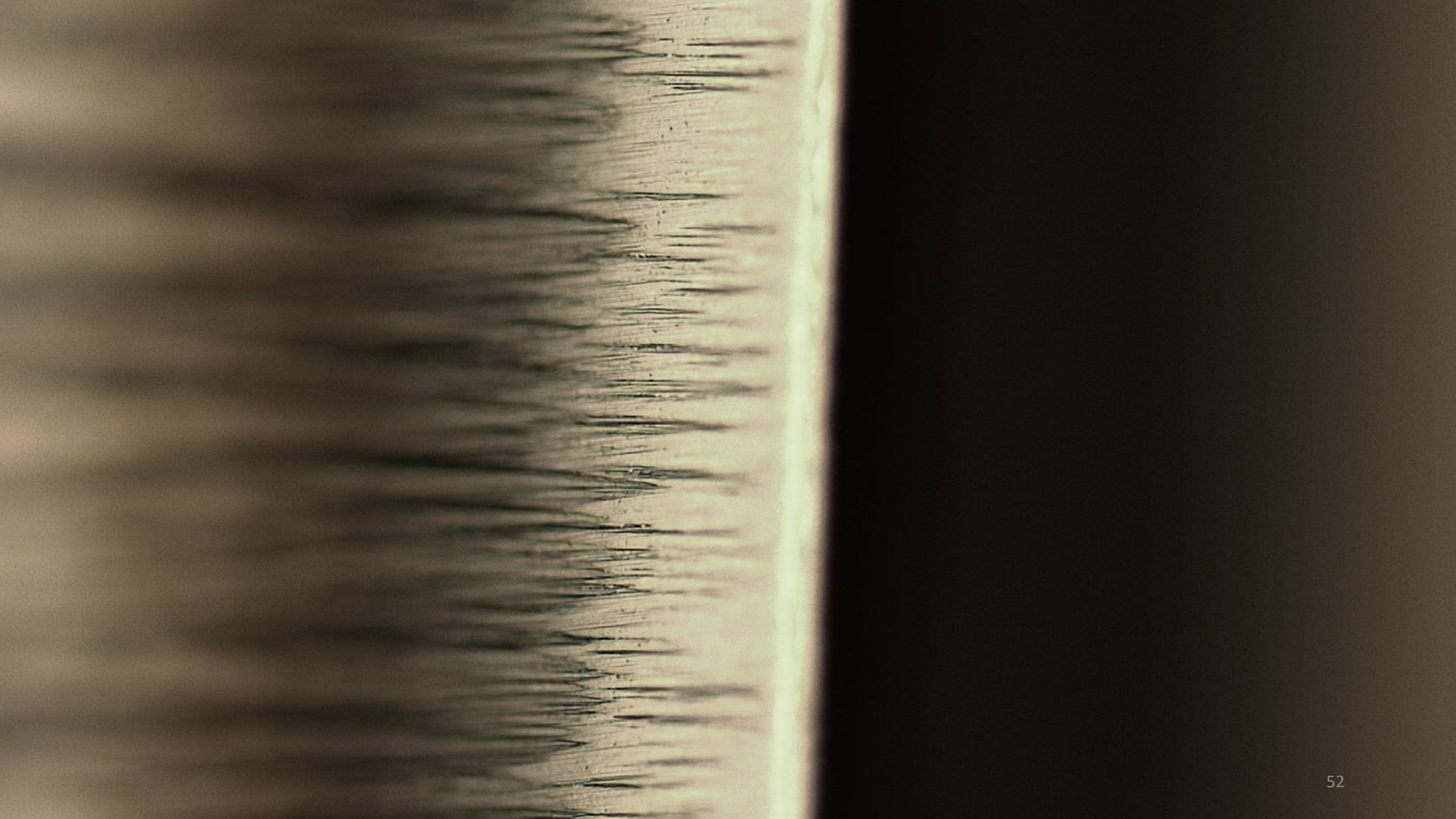
- Deionized Water (100 mL)
- Sodium Dodecyl Sulfate (500 mL)
- Acetic Acid (ca. 10 mL)

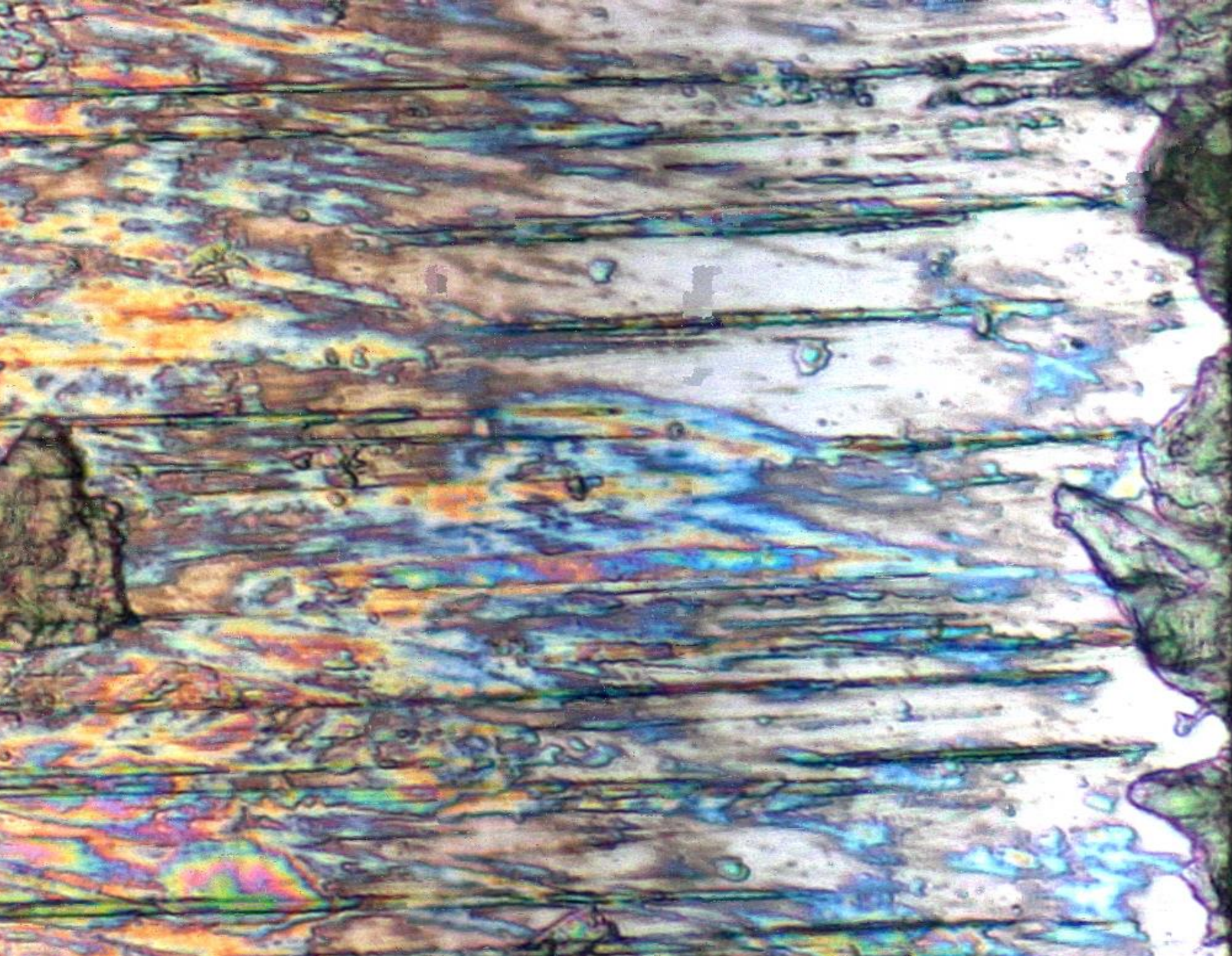
Prototype 2

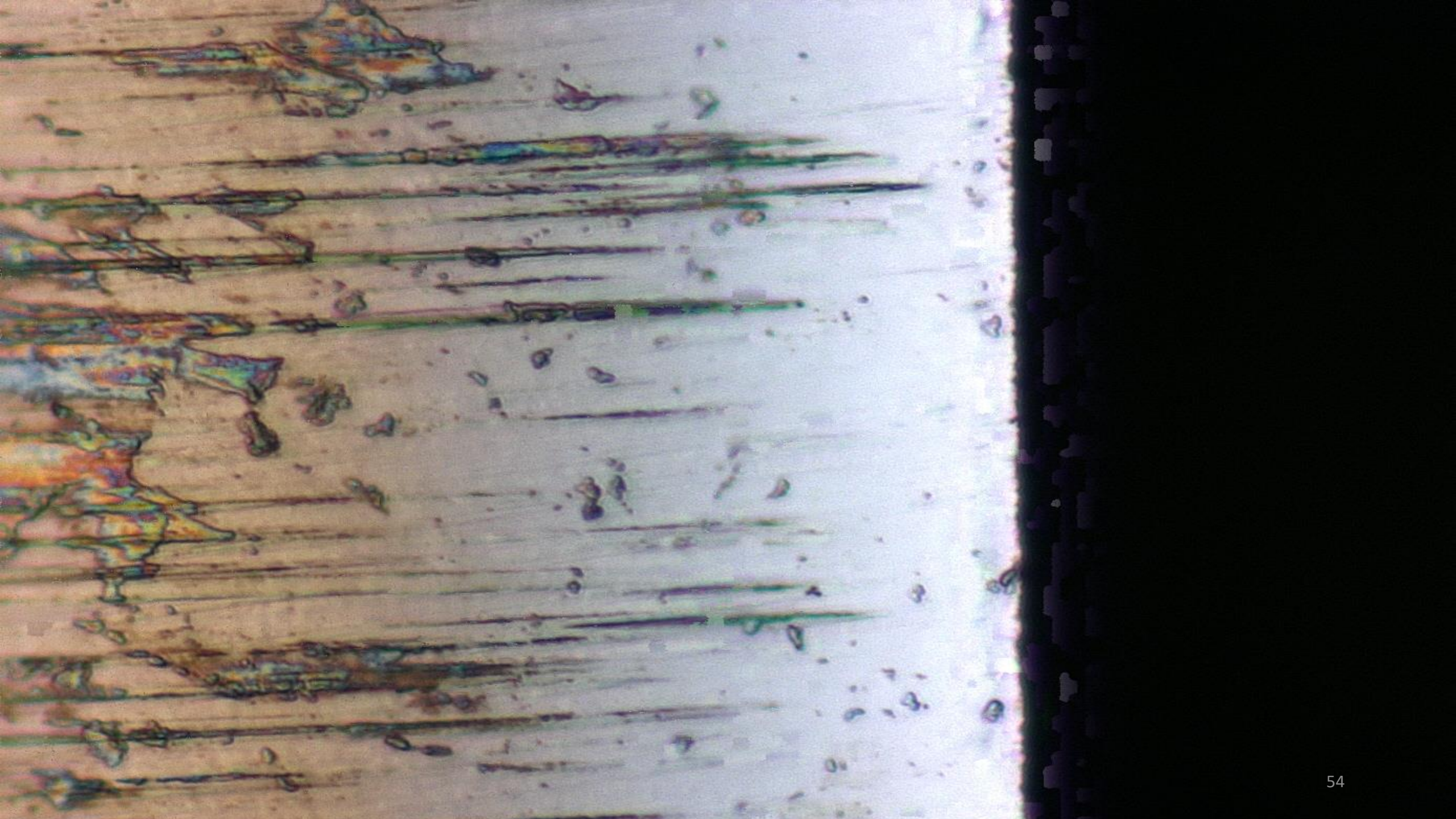
- Deionized Water (ca. 65 mL)
- Sodium Dodecyl sulfate (ca. 200 mg)
- Citric Acid (6 g)
- Isopropanol (40 mL)

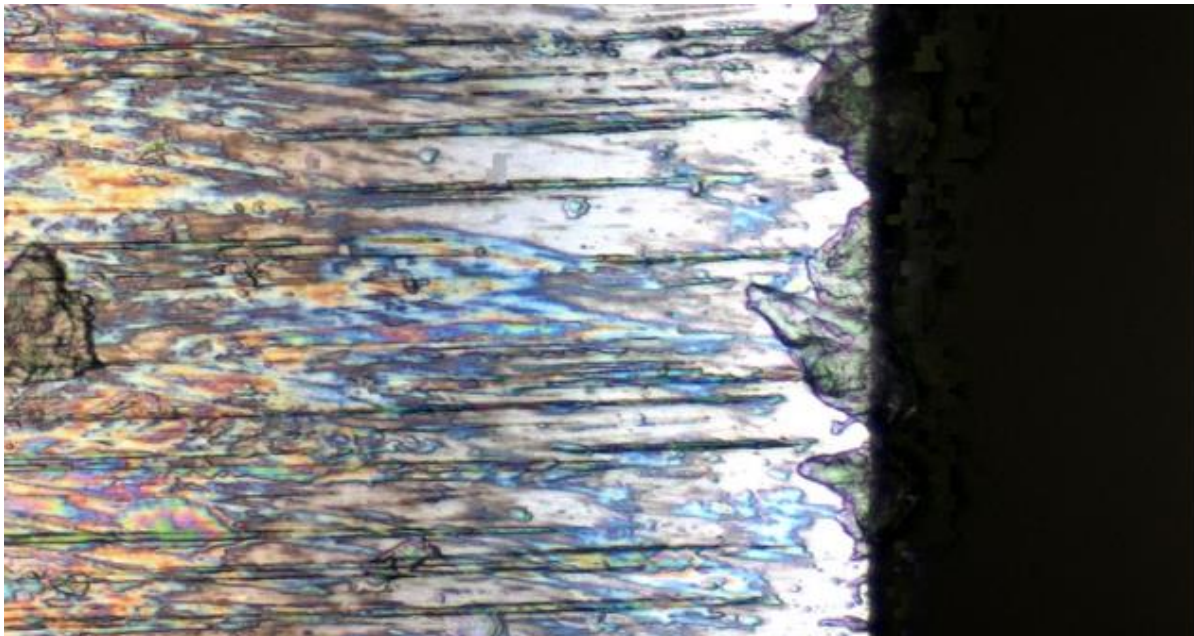
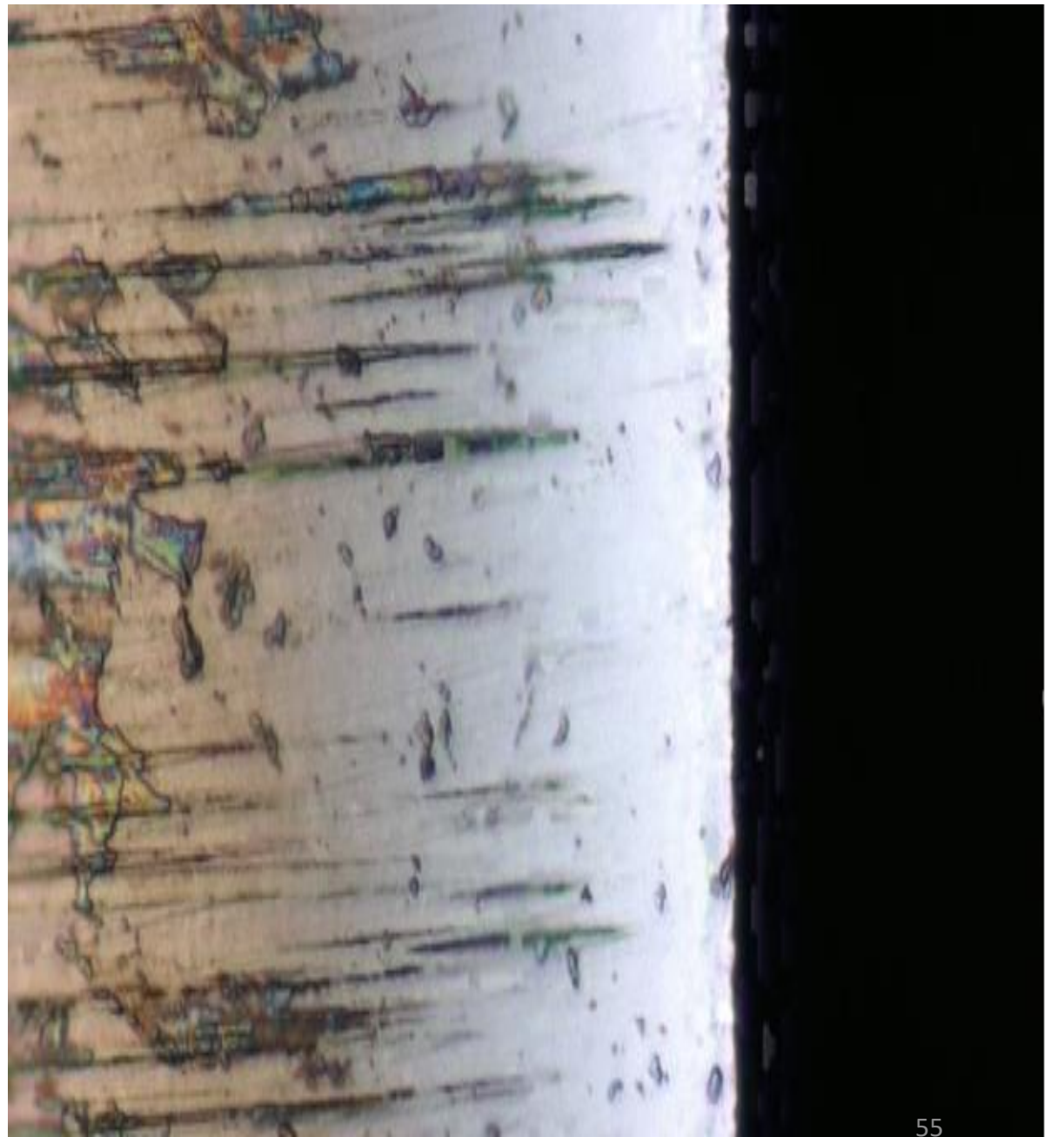
Final Product

- Deionized Water (50 mL)
- Sodium dodecyl Sulfate (200 mg)
- Citric Acid (5 g)
- Isopropanol (40 mL)
- Sodium Benzoate (50 mg, Anti-fungal)
- Benzoic Acid (50 mg, Anti-corrosive)
- Perfume (~0.5 mL)









Projected Profitability

	CH	DE+AU+CH	Schengen	Europe	Asia-Pacific	NA	Rest	World
BRUTTO	\$ 559'000	\$ 6'990'000	\$ 28'000'000	\$ 55'900'000	\$ 350'000'000	\$ 28'000'000	\$ 140'000'000	\$ 609'000'000
OPEX	\$ 240'000	\$ 3'000'000	\$ 12'000'000	\$ 24'000'000	\$ 150'000'000	\$ 12'000'000	\$ 60'100'000	\$ 262'000'000
CAPEX	\$ 138'000	\$ 138'000	\$ 299'000	\$ 463'000	\$ 2'220'000	\$ 299'000	\$ 956'000	\$ 1'670'000
PROFIT	\$ 181'000	\$ 3'850'000	\$ 15'600'000	\$ 31'400'000	\$ 197'000'000	\$ 15'600'000	\$ 78'800'000	\$ 346'000'000
Investment	\$ 367'000	\$ 1'060'000	\$ 3'670'000	\$ 7'040'000	\$ 42'500'000	\$ 3'670'000	\$ 17'100'000	\$ 73'700'000

Multiplier	Value
Setup Multiplier:	8
Interest rate	40%
Years	10
ACC:	0.414323844
CEPCI ref 2020 to 2010	1.082425563
Working Capital (months of operation)	3

Return on Investments

Equiv. to CH with 10% use rate

Value	Switzerland	Schengen
Depreciation Factor	8	8
Tax Rate	20%	20
Years	10	10
Net Present Value	\$ 241'000	\$ 5'003'000
Annual avg. Cashflow	\$ 134'000	\$ 2'770'000
Return on Investment	36%	260%
Payback time	3.8	1.4

- Higher financial risk
- Lower return on investment
- Small investment

- Lower financial risk
- Larger return on investment
- Larger investment

Thank you
for your
Attention



CUTTING EDGE SOLUTION

Supporting Information

Market Overview

						Markets		----> possible expansion of production ---->							
Feels free to edit the values						CH	DE+AU+CH	Schengen	Europe	Asia-Pacific	NA	Rest	World		
Factor	Min Value	Max Value	Geom Mean	Unit	Metric										
					Population Size	8'000'000	100'000'000	400'000'000	800'000'000	5'000'000'000	400'000'000	2'000'000'000	8'708'000'000		
(guesstimate) (from surveys at star of semester)	Proportion Shaving	0.600	0.950	0.7549834	Person Person ⁻¹	Potential Customers	6'039'867.55	75'498'344.35	301'993'377.41	603'986'754.82	3'774'917'217.64	301'993'377.41	1'509'966'887.05	6'574'395'826.23	
	Blades per year	3.000	54.000	12.727922	Blades Anno ⁻¹										
Estimate from CH shop prices "adapted" to different economics					Blades Person ⁻¹	No. Blades used	76'874'963	960'937'043	3'843'748'171	7'687'496'341	48'046'852'134	3'843'748'171	19'218'740'854	83'678'397'677	
	Cost per Blade	0.500	3.000	1.2247449	USD Blade ⁻¹	Yearly Market Value	USD 94'152'217	USD 1'176'902'715	USD 4'707'610'859	USD 9'415'221'718	USD 58'845'135'738	USD 4'707'610'859	USD 23'538'054'295	USD 102'484'688'401	
Wild Guess Guesstimate	% of People using product	0.001	0.100	0.01	Customer Person ⁻¹	No Customers	60'398.68	754'983.44	3'019'933.77	6'039'867.55	37'749'172.18	3'019'933.77	15'099'668.87	65'743'958.26	
	Cost of Product	1.000	3.500	1.8708287	USD Customer ⁻¹										
Estimate	Bottle Volume mL per shave	25.000	100.000	50	Customer Person ⁻¹	Production Volume [L a ⁻¹]	14'946.20	186'827.51	747'310.06	1'494'620.11	9'341'375.70	747'310.06	3'736'550.28	16'268'939.92	
	No of shaves / week	1.000	3.000	1.7320508											
Estimate	Bottles per year	0.540	45.360	4.9491818	Bottle Anno ⁻¹	No Bottles	298'924.02	3'736'550.28	14'946'201.12	29'892'402.25	186'827'514.03	14'946'201.12	74'731'005.61	325'378'798.44	
					USD Customer ⁻¹	Expected BRUTTO	559'235.64	6'990'445.48	27'961'781.92	55'923'563.83	349'522'273.97	27'961'781.92	139'808'909.59	608'727'992.34	
CURRENTLY ONLY GUESSED	Total costs per Bottle	0.500	1.500	0.8660254	USD Bottle ⁻¹										
					USD Customer ⁻¹	Expected TARA	258'875.80	3'235'947.47	12'943'789.86	25'887'579.72	161'797'373.28	12'943'789.86	64'718'949.31	281'786'305.30	
					USD Anno ⁻¹	Expected NETTO	300'359.84	3'754'498.01	15'017'992.06	30'035'984.11	187'724'900.69	15'017'992.06	75'089'960.28	326'941'687.04	

Material Prices & OPEX

PRICING	Raw Resources				
	min	max	Geom Mean	min volume [kg] (ca.)	
USD kg ⁻¹	water	0.0014	0.002	0.00167332	
	SDS	0.9	5.000	2.121320344	
	Citric Acid	0.450	0.8	0.6	
	Isoprop.	0.9	1.5	1.161895004	
	Na Benz.	0.8	5	2	
	Benz. Acid.	1.5	6	3	
	Parfume	15	25	19.36491673	
	Bottle	0.3	2	0.774596669	

			Markets								
			----> possible expansion of production ---->								
			CH	DE+AU+CH	Schengen	Europe	Asia-Pacific	NA	Rest	World	
Resource NEEDS	Chemical	g L ⁻¹	Production Volume (copy)	14'946.20	186'827.51	747'310.06	1'494'620.11	9'341'375.70	747'310.06	3'736'550.28	16'268'939.92
	water	500	mass of	7'473.10	93'413.76	373'655.03	747'310.06	4'670'687.85	373'655.03	1'868'275.14	8'134'469.96
	SDS	2	chemicals	29.89	373.66	1'494.62	2'989.24	18'682.75	1'494.62	7'473.10	32'537.88
	Citric Acid	25	[kg]	373.66	4'670.69	18'682.75	37'365.50	233'534.39	18'682.75	93'413.76	406'723.50
	Isoprop.	400		5'978.48	74'731.01	298'924.02	597'848.04	3'736'550.28	298'924.02	1'494'620.11	6'507'575.97
	Na Benz.	0.5		7.47	93.41	373.66	747.31	4'670.69	373.66	1'868.28	8'134.47
	Benz. Acid.	0.5		7.47	93.41	373.66	747.31	4'670.69	373.66	1'868.28	8'134.47
	Parfume	5		74.73	934.14	3'736.55	7'473.10	46'706.88	3'736.55	18'682.75	81'344.70
	water		price of	12.50	156.31	625.24	1'250.49	7'815.56	625.24	3'126.22	13'611.57
	SDS		chemicals	63.41	792.64	3'170.57	6'341.14	39'632.10	3'170.57	15'852.84	69'023.27
	Citric Acid		[USD]	224.19	2'802.41	11'209.65	22'419.30	140'120.64	11'209.65	56'048.25	244'034.10
	Isoprop.		see below	6'946.37	86'829.58	347'318.33	694'636.66	4'341'479.10	347'318.33	1'736'591.64	7'561'120.01
	Na Benz.			14.95	186.83	747.31	1'494.62	9'341.38	747.31	3'736.55	16'268.94
	Benz. Acid.			22.42	280.24	1'120.97	2'241.93	14'012.06	1'120.97	5'604.83	24'403.41
	Parfume			1'447.16	18'089.50	72'357.99	144'715.97	904'474.81	72'357.99	361'789.93	1'575'233.33
	Bottle	1 Piece	Bottle	231'545.55	2'894'319.40	11'577'277.61	23'154'555.21	144'715'970.09	11'577'277.61	57'886'388.04	252'037'333.51
	OPEX		Raw Resource Cost [USD]:	240'276.55	3'003'456.91	12'013'827.66	24'027'655.32	150'172'845.74	12'013'827.66	60'069'138.30	261'541'028.14

Operational Units

				Markets									
				----> possible expansion of production ---->									
OP. Units NEEDS	Units	Use time [h]	Op time 2 [h]	No Operations	CH	DE+AU+CH	Schengen	Europe	Asia-Pacific	NA	Rest	World	
once a day for half a year (10s per bottle) almost all year	Stirred Tank	24.00	4000.00	166.67	Required Volume [L]:	89.68	1'120.97	4'483.86	8'967.72	56'048.25	4'483.86	22'419.30	97'613.64
	water filter ? Deioniser ? (might be not worth it)	0.00167	8000.00	4800000.00	No. Machines needed to fulfil production goal	0.06	0.78	3.11	6.23	38.92	3.11	15.57	67.79
	Production Volume (copy)				14'946.20	186'827.51	747'310.06	1'494'620.11	9'341'375.70	747'310.06	3'736'550.28	16'268'939.92	
	liter per second:				3.74	46.71	186.83	373.66	2'335.34	186.83	934.14	4'067.23	

Mixers

- Low Volumes: 1 Batch a day; every second day

Bottling

- Automomous bottling: continous + 700h for maintainace
- Largest cost:

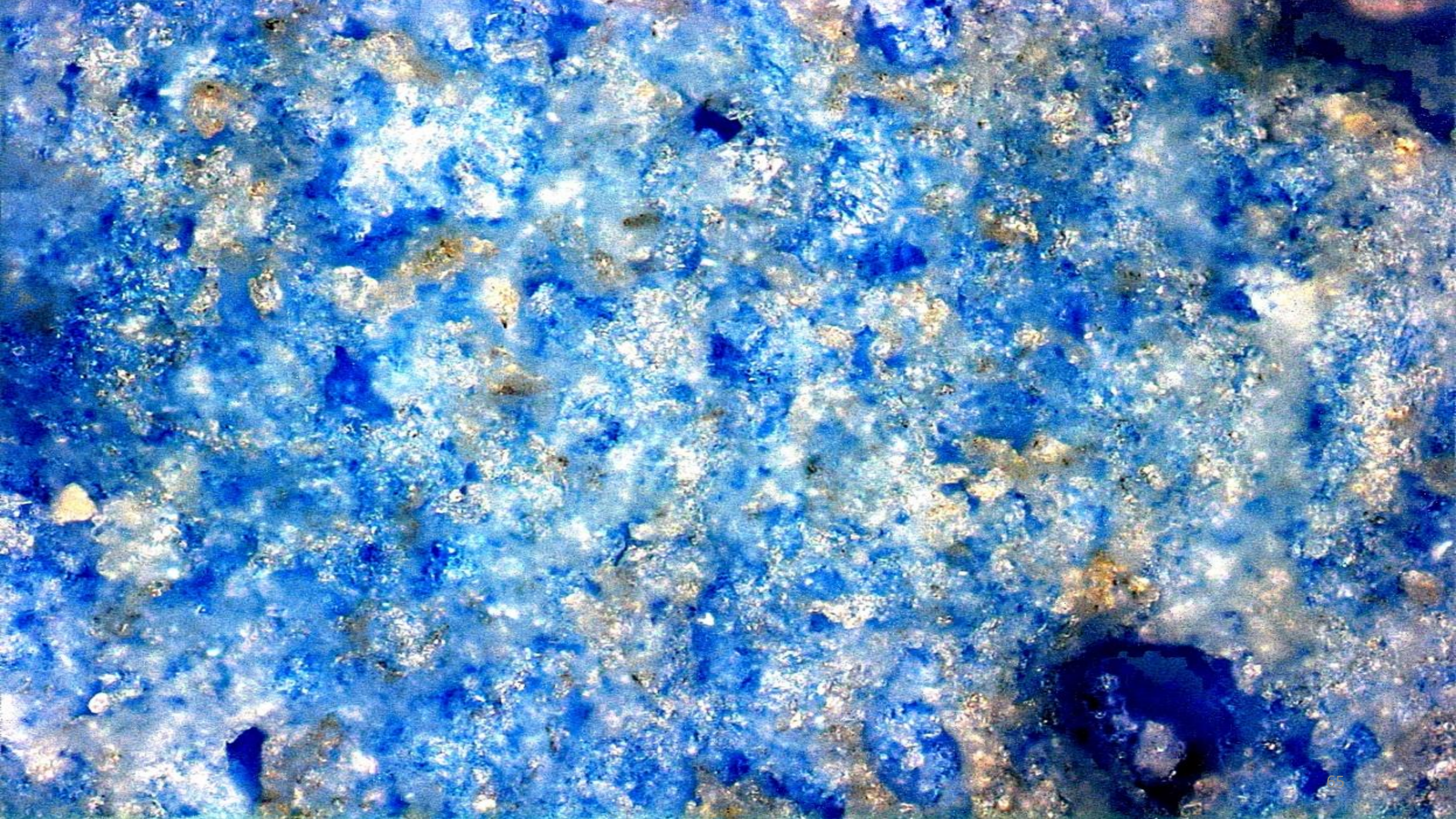
Equipment Investment + CAPEX

Number of Units	CH	DE+AU+CH	Schengen	Europe	Asia-Pacific	NA	Rest	World	
Water ion exchange		1	1	2	3	13	2	6	23
Centrifugal Pump		1	1	2	3	19	2	8	33
Static Mixer		1	1	4	8	47	4	19	82
Bottling Machine		1	1	4	7	39	4	16	68
Unit Size									
Water ion exchange		1.00	1.00	1.04	2.08	12.97	1.04	5.19	1
Centrifugal Pump		1.00	1.00	0.41	0.82	5.15	0.41	2.06	1
Static Mixer		1.00	1.00	1.04	2.08	12.97	1.04	5.19	2
Bottling Machine									
Costs									
Water ion exchange	\$	14'698.7	\$ 14'698.7	\$ 14'725.2	\$ 15'450.4	\$ 23'065.1	\$ 14'725.2	\$ 17'626.0	\$ 14'698.7
Centrifugal Pump	\$	8'138.7	\$ 8'138.7	\$ 8'057.1	\$ 8'114.3	\$ 8'714.3	\$ 8'057.1	\$ 8'285.7	\$ 8'138.7
Static Mixer	\$	586.9	\$ 586.9	\$ 587.5	\$ 605.0	\$ 789.0	\$ 587.5	\$ 657.6	\$ 586.9
Bottling Machine	\$	15'000.0	\$ 15'000.0	\$ 60'000.0	\$ 105'000.0	\$ 585'000.0	\$ 60'000.0	\$ 240'000.0	\$ 1'020'000.0
CAPEX	\$	137'858.7	\$ 137'858.7	\$ 299'114.2	\$ 463'434.9	\$ 2'215'710.2	\$ 299'114.2	\$ 956'396.8	\$ 1'669'478.9
Investment	\$	367'463.7	\$ 1'058'258.8	\$ 3'670'415.8	\$ 7'040'271.7	\$ 42'483'758.0	\$ 3'670'415.8	\$ 17'149'839.2	\$ 73'732'651.6

Setup Facotr:	8
Interest	40%
Years	10
ACC:	0.414323844
CEPCT ref 2020 to 2010	1.082425563

Projection Switzerland		Year	Profit	Depreciation	Taxable income	Cashflow	Net value @ year
		1	\$ -		\$ -	\$ -	\$ -
Depreciation Factor	0.125	2	\$ 90'550		\$ -	\$ 90'550	\$ 46'199
Tax Rate	20%	3	\$ 181'100		\$ 57'478	\$ 181'100	\$ 65'999
Net Present Value		4	\$ 181'100		\$ 0.729	\$ 169'605	\$ 44'149
Anno Avg CF	\$ 133'843.02	5	\$ 181'100		\$ 0.6561	\$ 150'833	\$ 28'045
Payback time	2.745482623	6	\$ 181'100		\$ 0.59049	\$ 150'238	\$ 19'953
ROI	36%	7	\$ 181'100		\$ 0.531441	\$ 149'702	\$ 14'201
		8	\$ 181'100		\$ 0.4782969	\$ 149'220	\$ 10'111
		9	\$ 181'100		\$ 0.43046721	\$ 148'786	\$ 7'201
		10	\$ 181'100		\$ 0.387420489	\$ 148'395	\$ 5'130

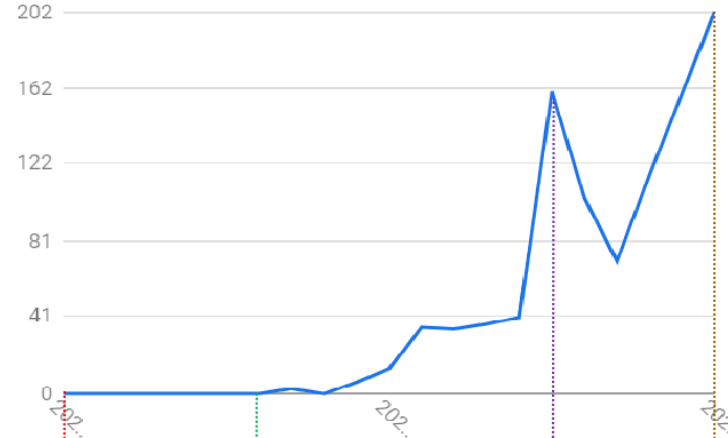
Projection Schengen		Year	Profit	Depreciation	Taxable income	Cashflow	Net value @ year
		1	\$ -		\$ -	\$ -	\$ -
Depreciation Factor	0.125	2	\$ 1'924'565		\$ -	\$ 1'924'565	\$ 981'921
Tax Rate	20%	3	\$ 3'849'130		\$ 1'891'493	\$ 3'849'130	\$ 1'402'744
Net Present Value		4	\$ 3'849'130		\$ 0.729	\$ 3'470'831	\$ 903'486
Anno Avg CF	\$ 2'774'824.24	5	\$ 3'849'130		\$ 0.6561	\$ 3'085'257	\$ 573'655
Payback time	0.381378666	6	\$ 3'849'130		\$ 0.59049	\$ 3'084'662	\$ 409'675
ROI	262%	7	\$ 3'849'130		\$ 0.531441	\$ 3'084'126	\$ 292'574
		8	\$ 3'849'130		\$ 0.4782969	\$ 3'083'644	\$ 208'949
		9	\$ 3'849'130		\$ 0.43046721	\$ 3'083'210	\$ 149'228
		10	\$ 3'849'130		\$ 0.387420489	\$ 3'082'819	\$ 106'578



Advertising improvement

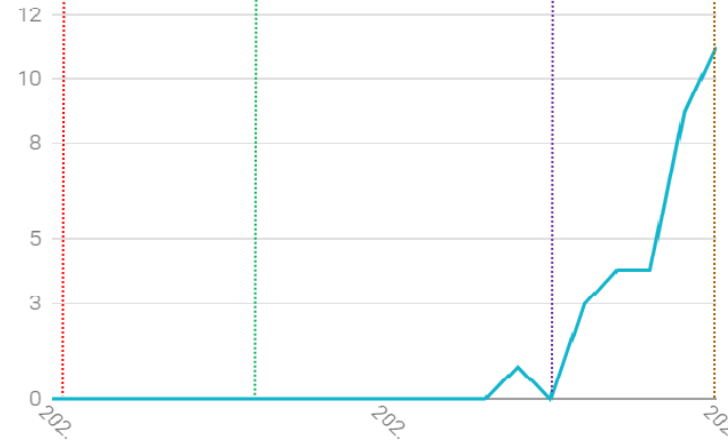
979

Impressions



- **Nov.16**
Start advertising
- **Nov. 23**
Increase budget
Change keywords
Expanded the advertising area (CH, DE, AT)
- **Nov.29**
Expanded advertising area again (CA, US, UK, SG, etc.)
Chang Headings
Add microscope photos of used blades.
- **Dec.02**
End of ad

32
hit count



Advertising · cuttingedgesolution.wordpress...

[How to care for your razors](#) | Clean, sharp, longer lasting | Make razor...

Perfect new product to clean blade. Portable, easy to operate, save you time and money. No irritation. Rich in vitamins....

Advertising · cuttingedgesolution.wordpress...

[New way to clean razors](#) | Fast, economical, skin care | Leading a...

Innovative blade cleaning products.Contact us to get your unique product. Clean, sharp and longer lasting blades. Develop the...

Advertising · cuttingedgesolution.wordpress...

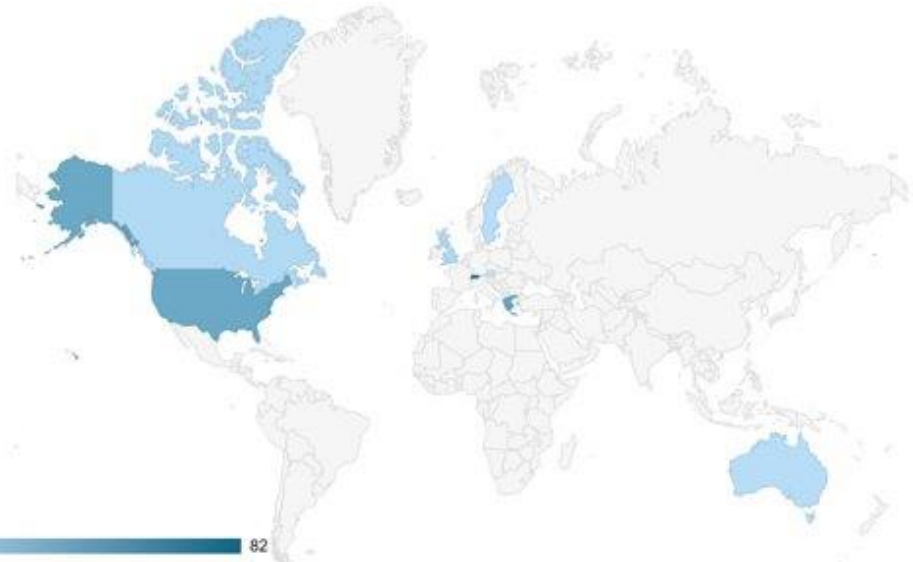
[How dirty is your razor](#) | Blade is actually very fragile | How to clean...

Proper cleaning can aid in extending the razors overall lifetime and perceived sharpness. We are a group of ETH Zurich....

Advertising · cuttingedgesolution.wordpress...

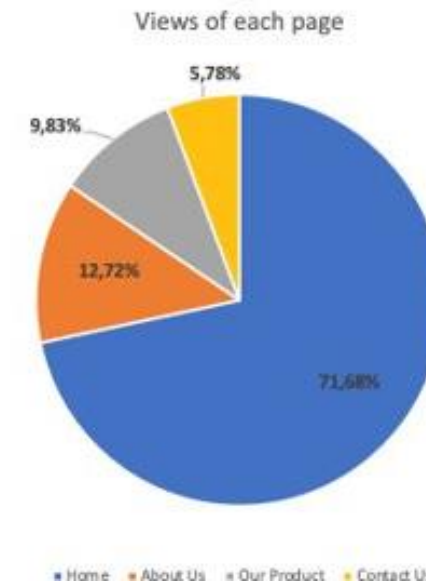
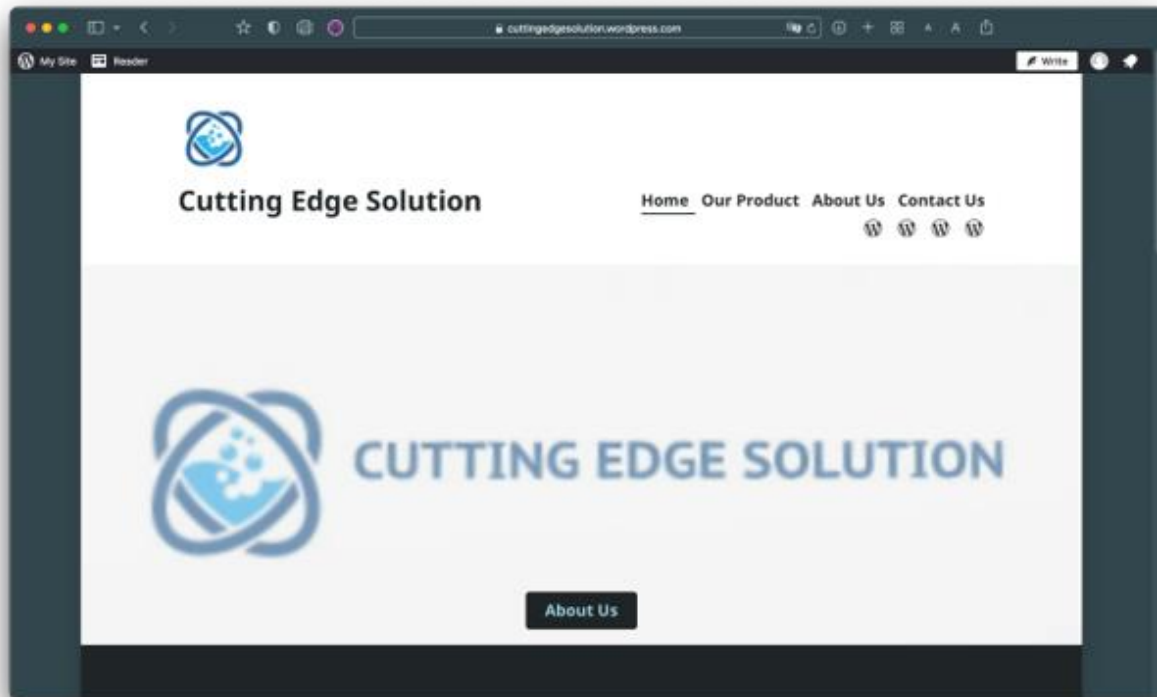
[Is your razor really clean](#) | How to protect razor blades | Right way to...

Innovative products that removes stains deposited on the razor's sharp edge. No damage to the blade, safe, cheap, fast an...



Country	Views
Switzerland	82
Greece	38
United S	37
Canada	5
United K	5
Australia	3
Sweden	2
Austria	1

Advertising improvement



Advertising reactions

5



- 5 Five people are very **interested** in our product.
- 4 people are very concerned about whether our products can **clean** blades very well.
- 3 people said they **never thought** their blades were so dirty.
- 3 people wanted to choose the **flavour** of the product.
- 1 person wants to know whether the product is really **safe** and whether its ingredients can cause skin allergies.

18-26 years old

9



- 2 people said that their shavers have a long service life (more than three years) and their shavers still had stable performances. They thought it was **not necessary** to buy it.
- 5 people said they **never thought** their blades were so dirty.
- 3 people said they **might** try our product, 2 people wanted to wait for the **feedback**.
- 2 people Three people preferred the product with **no smell**.
- 6 people thought the product pricing was **reasonable**.