Titanium Metal Injection Molding

Project completed for Kinetics, Inc.

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Presentation Agenda

- Background of Kinetics
- Background of MIM
- Titanium Metal Injection Molding
- Potential Market
- Investment Costs
- Expected Cash Generation
- Expected Return on Investments
- Conclusion
- Recommendations

Background of Kinetics

- Privately owned contract manufacturer
- Metal Injection Molding (MIM)
- Currently $12 million in sales
- 2nd largest in the US
- Looking to advance the industry and increase market with MIM Titanium

Background of MIM

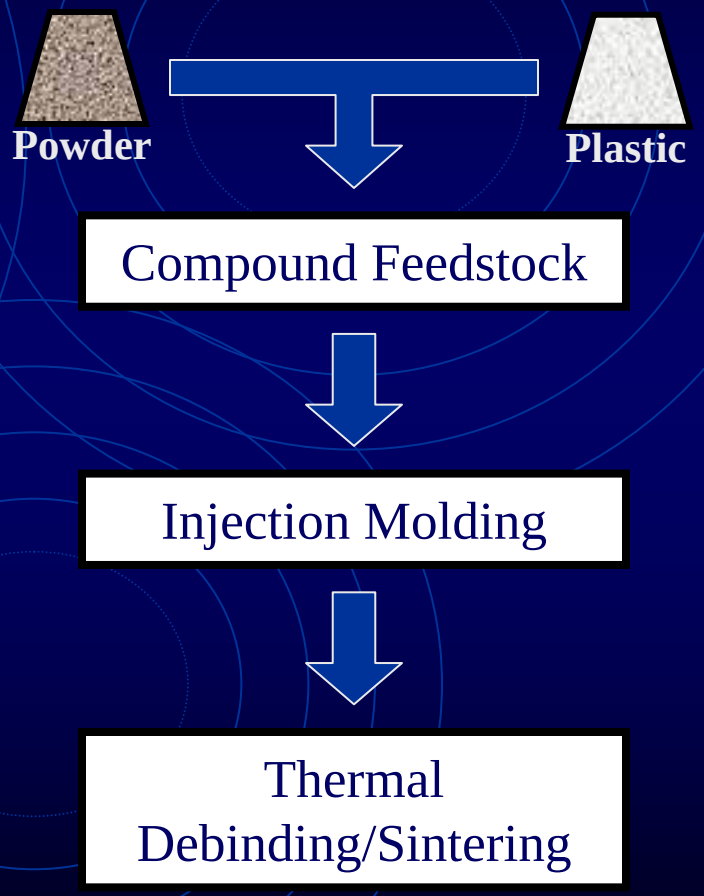
- Metal forming process
- Ferrous metals (carbon steel/stainless steel)
- Net Shape or Near Net Shape Process
- High Strength .. near wrought
- Highly complex
- Highly intricate details
- High production volumes (millions parts/yr)

Background MIM

- MIM does NOT replace other competing technologies.
- For Complex geometries
  - Better material properties than casting or P/M
  - Lower cost than CNC machine @ higher volumes
  - Greater design freedom than P/M or screw machining

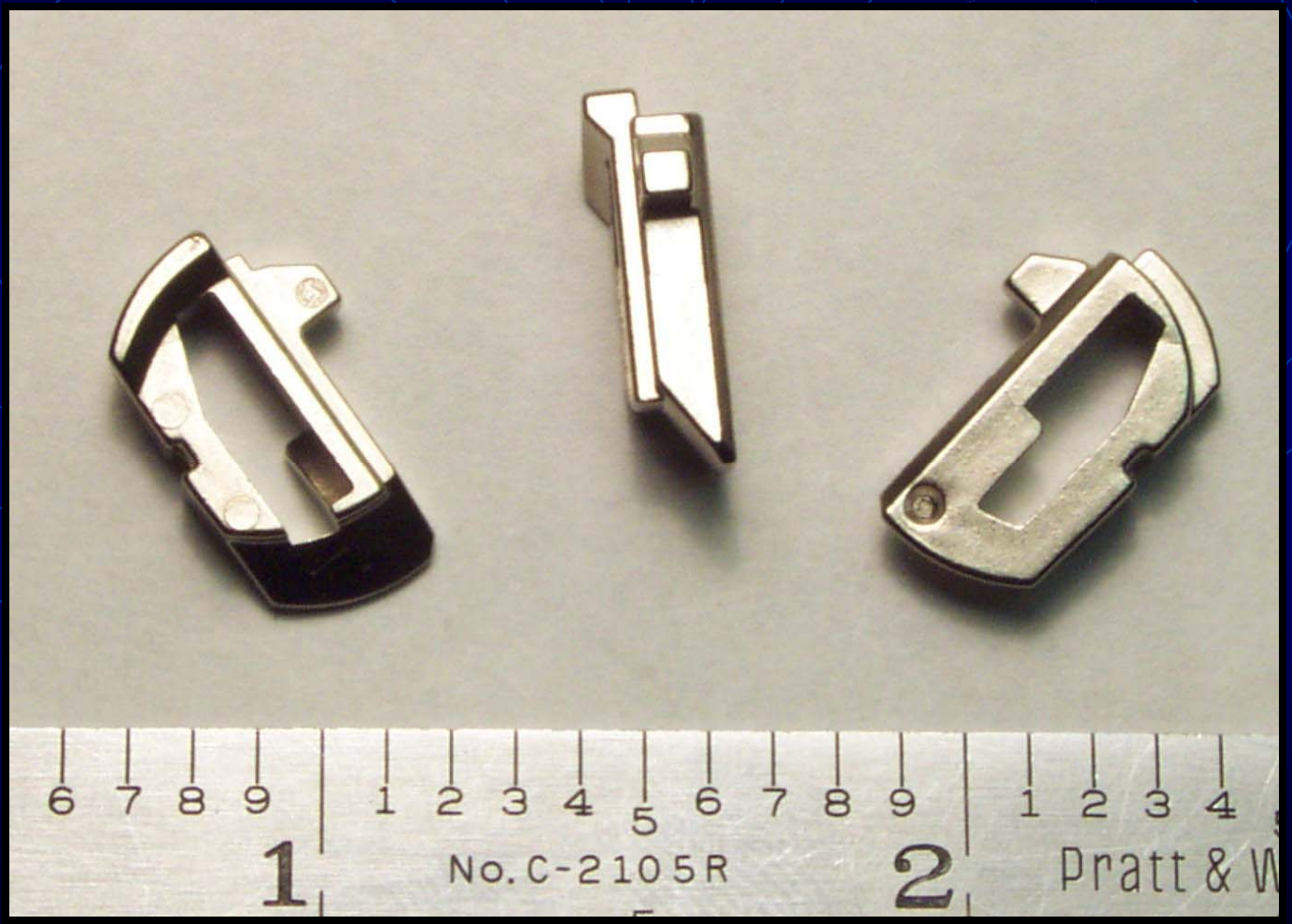
MIM Process

- Compound Feedstock
  - Fine Metal Powders
  - Binder (Thermoplastic)
  - Mix & Pelletize
- Mold
  - Create 3D shapes
- Debind
  - Remove binder
- Sinter
  - Heated to below M.P.
  - Molecular Bonding



Green-Debound-Sintered

MIM Parts



MIM Parts

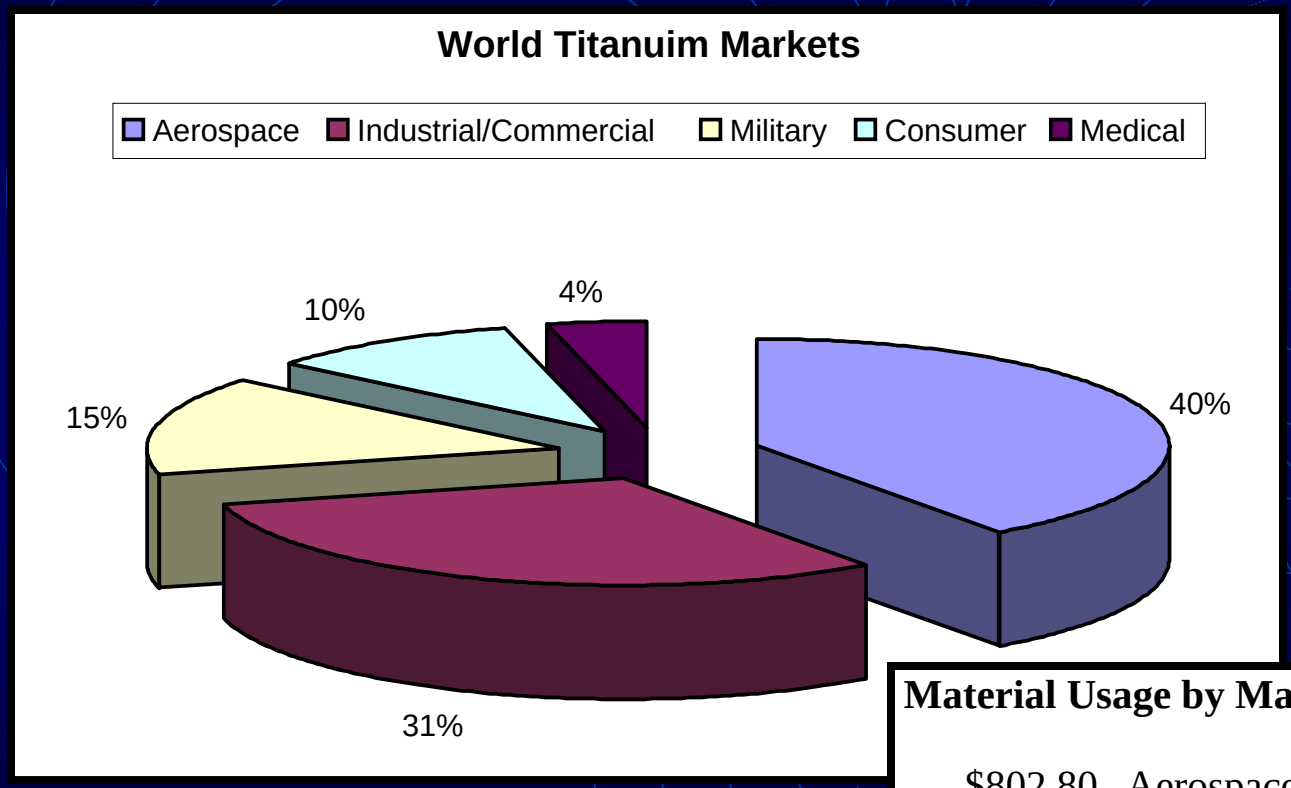
Non-captive MIM Market

- 220M Worldwide Market
  - Expected to grow ~25% per year
- Serves
  - Medical
  - Telecommunications
  - Automotive
  - Power Handtools
  - Consumer Goods

Titanium Metal Injection Molding

- Why Titanium
  - Corrosive resistant
  - Low Weight
  - Withstand high temperature
  - Highly explosive
- Research has been done, production capable
- No MIM competitors have implemented
- Steady growth in titanium use in all industries

Titanium Market



Material Usage by Market: ($ in Millions)

$802.80	Aerospace
$622.17	Industrial/Commercial
$301.05	Military
$200.70	Consumer
$80.28	Medical
$2,007.00	($000) Total

Potential Market

- No hard numbers for Finished Titanium Parts (i.e. medical, automotive, aerospace)
- Numbers for raw material usage only
- Kinetics not limited by Titanium market, limited by ramp up capabilities
- Forecasted net sales based on Kinetics history

Investment Cost

- Development costs
  - Process
  - Feedstock
  - Facility
- Capital Equipment Costs
  - Furnace
- Liquidity of company

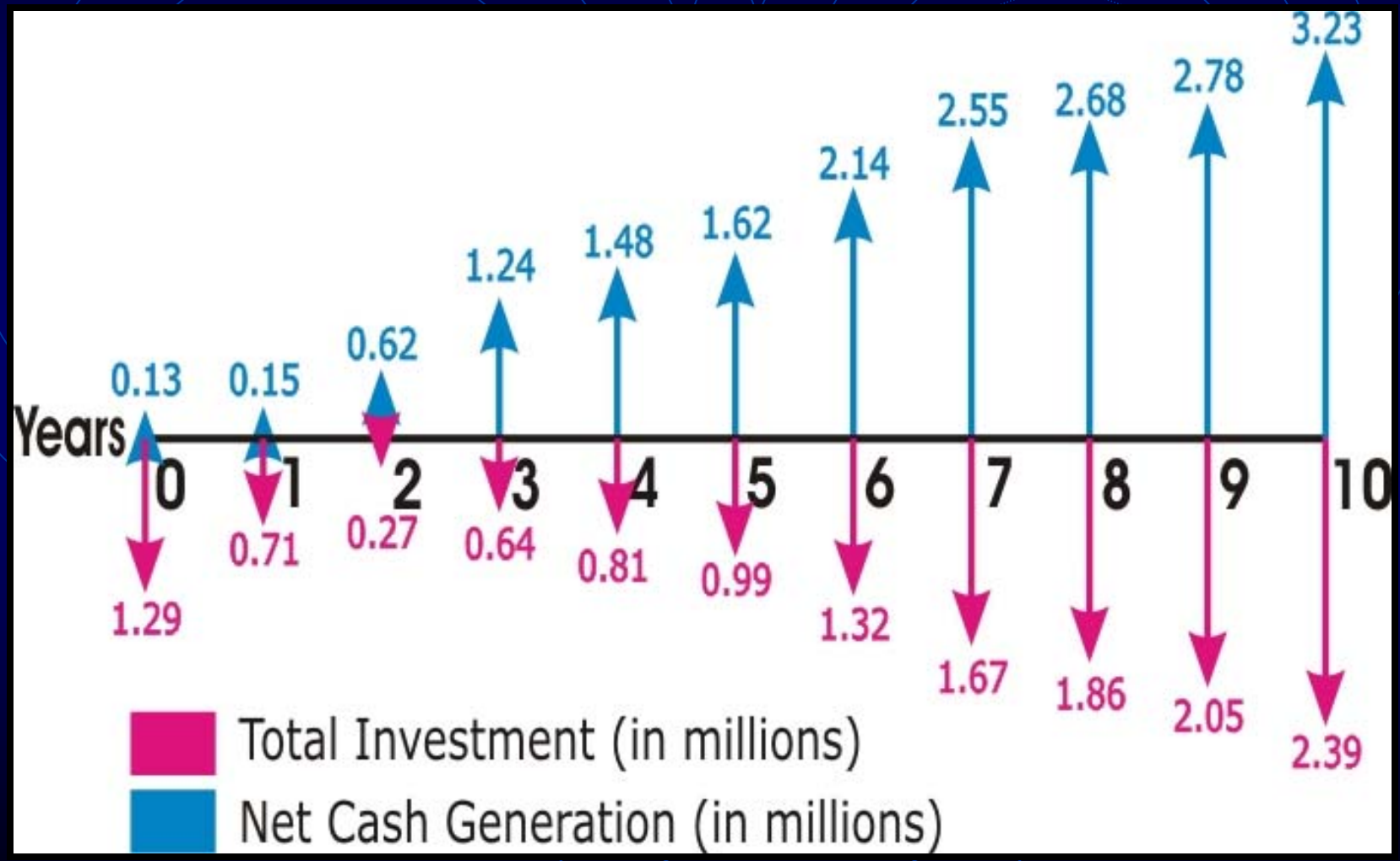
Expected Cash Generation

- Net Sales Forecast
- Cost of Sales
- Gross Margin
- Depreciation
- Net Cash Generation

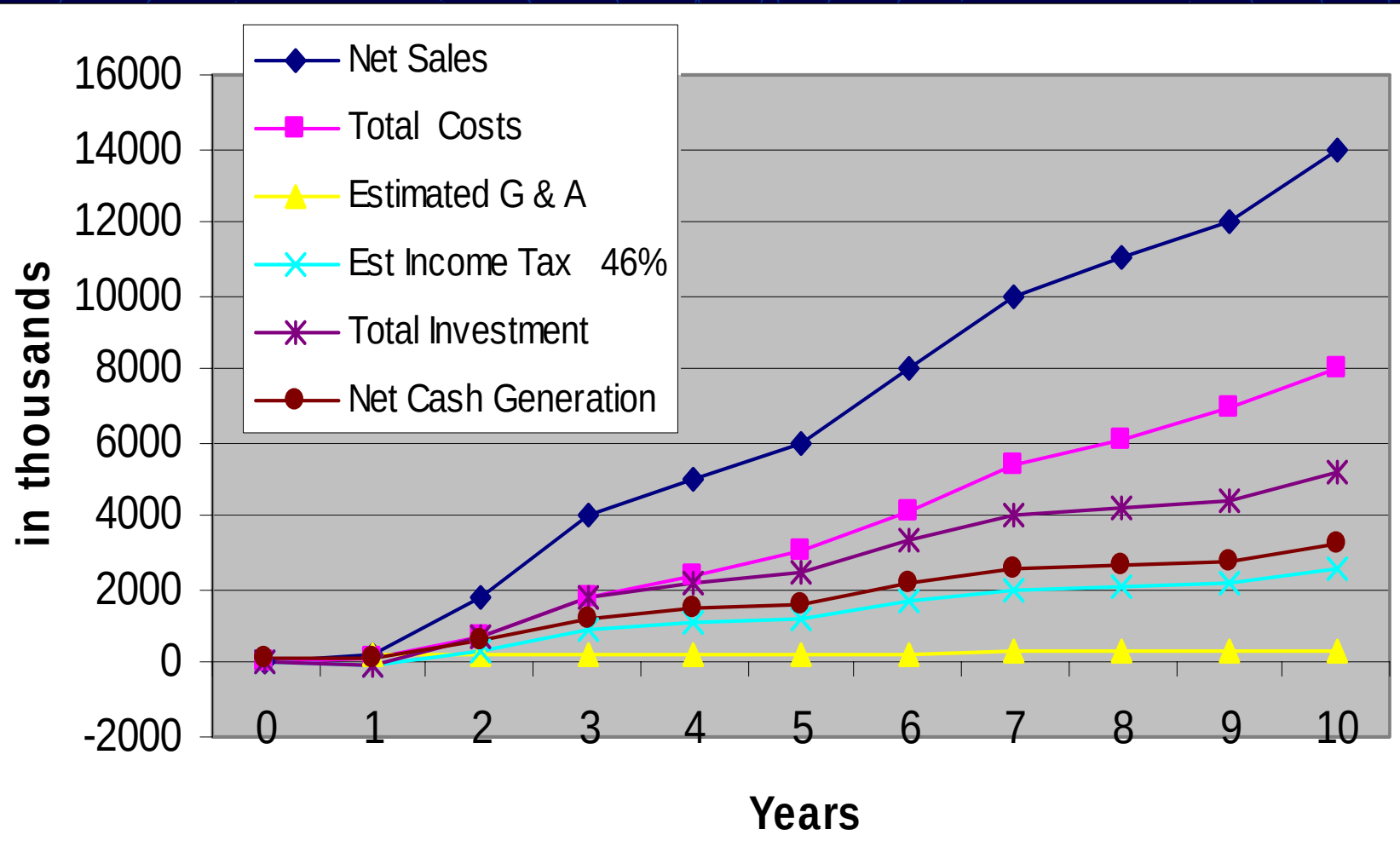
Development Costs

- Process Development (labor)
- Feedstock Development (labor)
- Facility Development (labor)
- Material Costs
- Supplies
- Outside contractors

Cash Flow


Years
0
1
2
3
4
5
6
7
8
9
10
0.13
0.15
0.62
1.24
1.48
1.62
2.14
2.55
2.68
2.78
3.23
1.29
0.71
0.27
0.64
0.81
0.99
1.32
1.67
1.86
2.05
2.39
Total Investment (in millions)
Net Cash Generation (in millions)

Summary Graph



Expected Return on Investments

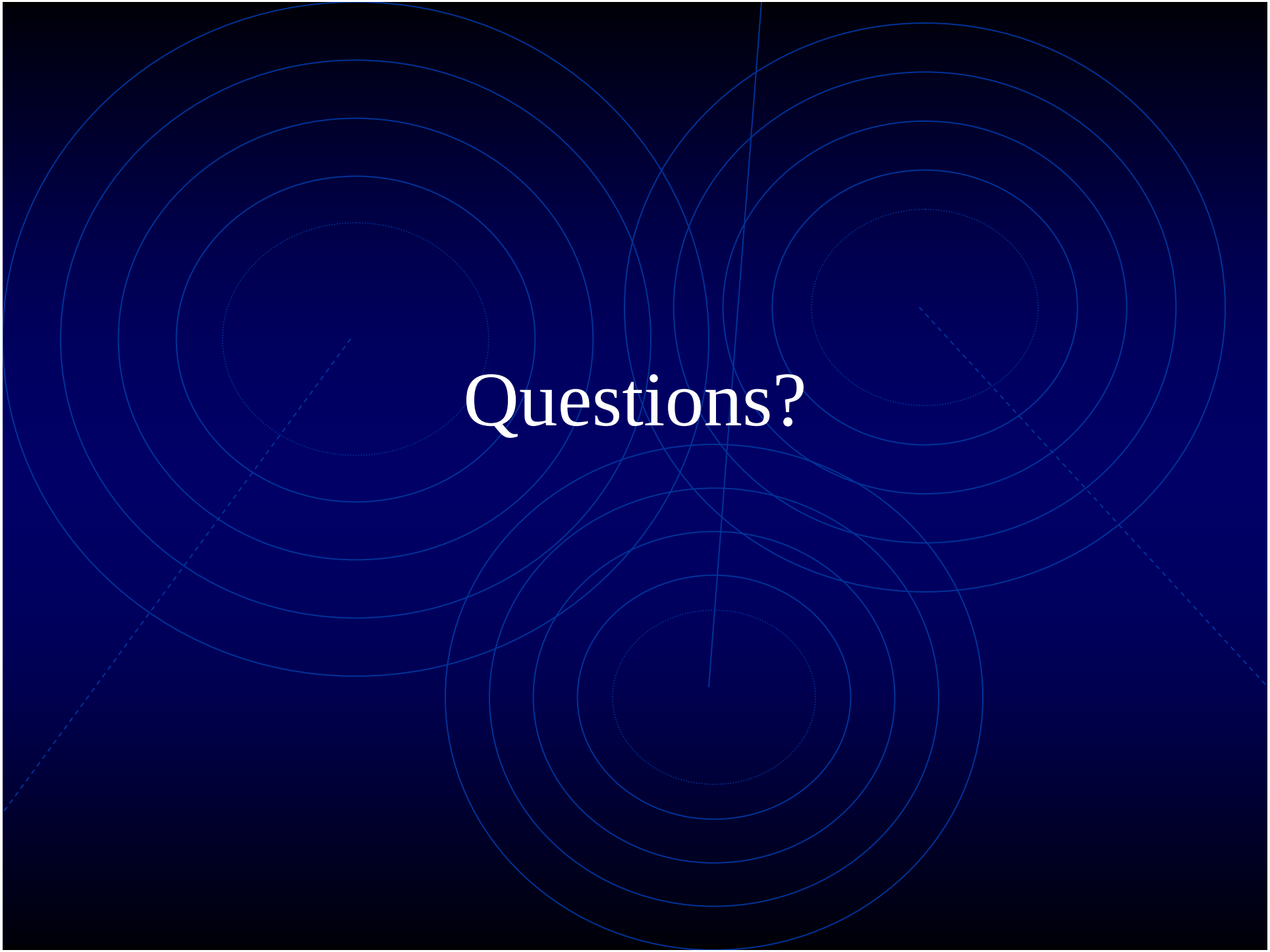
- Kinetics “Hurdle Rate” is 10% (MARR)
- Calculating NPV of cash flows
- Payback Period is 4.18 years.
- IRR of project is 26.8%

Conclusion

- IRR > MARR
- Payback period is acceptable for company
- Competitive advantage
- Expected gross margin is above company average for sustaining and growth
- Accept Project!

Recommendations

- Better potential market research
- More precise net sales forecast
- More precist information from other industry leaders
- Co-development with potential titanium customers
- Results based only on economic analysis


Questions?