



# STRATEGIC ASSUMPTIONS PRIORITIZATION

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## Summary

- Traditional tools for evaluating growth investments in core business markets distort results when tasked with white-space opportunities that by their nature lack the internal, historical data from which to extrapolate reliable cost and revenue estimates
- To avoid this pitfall when trying to expand into unfamiliar markets, Air Products applies a project planning model that embraces uncertainty and prizes investment efficiency over speed to completion
- Air Products prioritizes a business development opportunity's strategic assumptions to create learning-based milestones that scale investments to match reductions in the uncertainty of the opportunity's financial value

## Company Profile

Air Products and Chemicals, Inc., supplies atmospheric gases, process and specialty gases, performance materials, and chemical intermediates to customers throughout the world. With a culture based on innovation, operational excellence, and a commitment to safety and the environment, Air Products has built leading supply positions in key growth markets, including semiconductor and flat panel display materials, refinery hydrogen, home healthcare services, natural gas liquefaction, and advanced coatings and adhesives. The company is geographically diversified, with operations in over 30 countries and half its revenues outside of the United States.

## Selected Statistics

- FY2003 Revenues:* US\$6.3 Billion
- FY2003 Earnings:* US\$397 Million
- FY2003 Employees:* 18,500
- Headquarters:* Allentown, Pennsylvania, U.S.A.

## WHITE-SPACE OPPORTUNITIES

### From a Strong Foundation

After establishing a strong record of revenue performance within its core gases and specialty chemicals businesses, Air Products recognizes the advantages of pursuing new growth strategies from a position of strength and in 2002 commits to create “white-space” innovations.

White-space innovations are sustainable businesses that produce distinctive value for customers using organizational capabilities or technologies significantly different from those currently available in the core business units. Historical success rates are low for companies attempting white-space innovation, with most firms unable to develop high-confidence milestones for evaluating unfamiliar businesses.

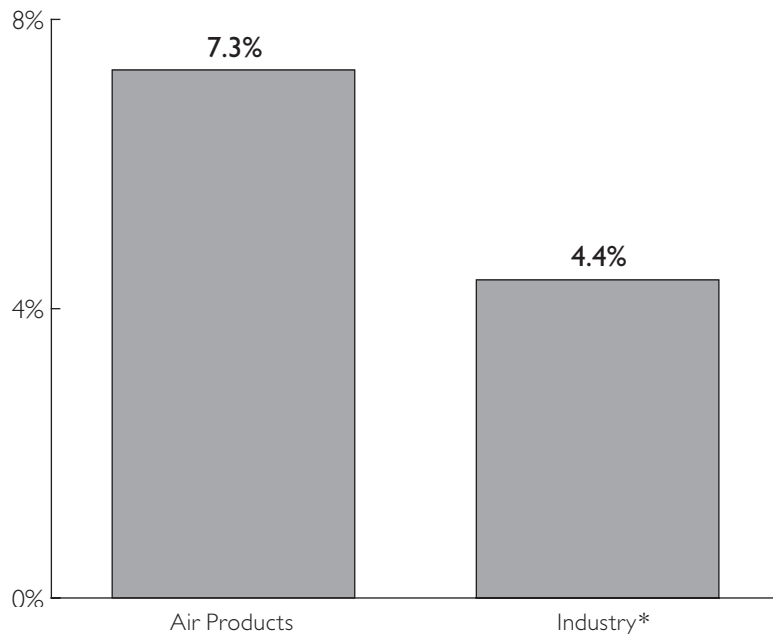
### Seeking New Growth Options

Concerned that exploring business options outside current products and markets could distract business unit development teams from executing their near-term strategies and maintaining quarterly financial performance, Air Products assigns responsibilities to a small Early Innovation Team to incubate a pipeline of ideas to market on the company’s behalf. This team constrains financial risk while looking at a wider array of options and longer-term payoffs than business units might comfortably consider. Co-located with corporate-level planning, development, and economic analysis groups, the Early Innovation Team maintains alignment with Air Products’ strategic goals and market intelligence as it explores new business building opportunities.

# MAINTAINING GROWTH MOMENTUM

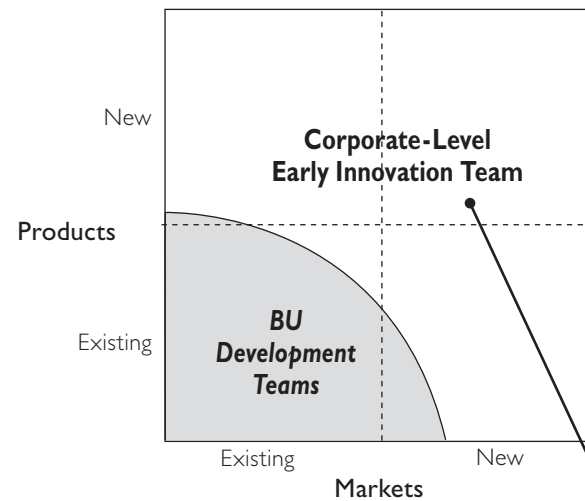
**To avoid distracting successful core businesses and keep its growth lead versus the industry...**

Inflation-Adjusted, Compound Annual Revenue Growth  
Air Products and Industry Performance, 1994–2003



**...Air Products charges a center-led incubation team to investigate and pursue white-space opportunities**

Responsibilities for Innovation  
Air Products, 2004



**Early Innovation Team**

- Targets ideas with a three-to-six year time horizon and mature annual revenue size of at least \$50 million
- Includes 13 members incubating approximately three new businesses simultaneously with a pipeline of 10 to 20 ideas in various stages of review
- Co-located and aligned with corporate strategy, M&A, strategic venturing, and economic analysis groups at corporate center

\* Industry data combines chemicals and industrial gases companies, removing pharmaceutical revenues.

Source: Standard and Poor's Compustat data; Air Products and Chemicals, Inc.; Corporate Strategy Board research.

## APPROACHES FOR SUPPORTING DISCONTINUOUS GROWTH

### Casting a Broad Net

To identify and pursue white-space opportunities, Air Products taps resources that core businesses do not typically require when developing their growth strategies. Air Products leverages a wide array of internal thinkers, external consultants, and business development techniques to help the company improve its ideation and implementation of new businesses. Some of these ideation resources include creativity expert Charlie Prather, Gary Hamel's Woodside Institute, Clayton Christensen's disruption concepts, and customer input from lead users.

In particular for white-space innovation, implementation requires explicitly breaking old habits when analyzing business models and framing ventures for investment. The processes for planning ventures that serve so well for evaluating investment choices in familiar, core business markets, unfortunately distort results when tasked with white-space opportunities.

### Planning Ways to Learn About White-Spaces

Air Products finds two approaches especially helpful for testing value propositions for white-space opportunities and assembling reliable business plans.

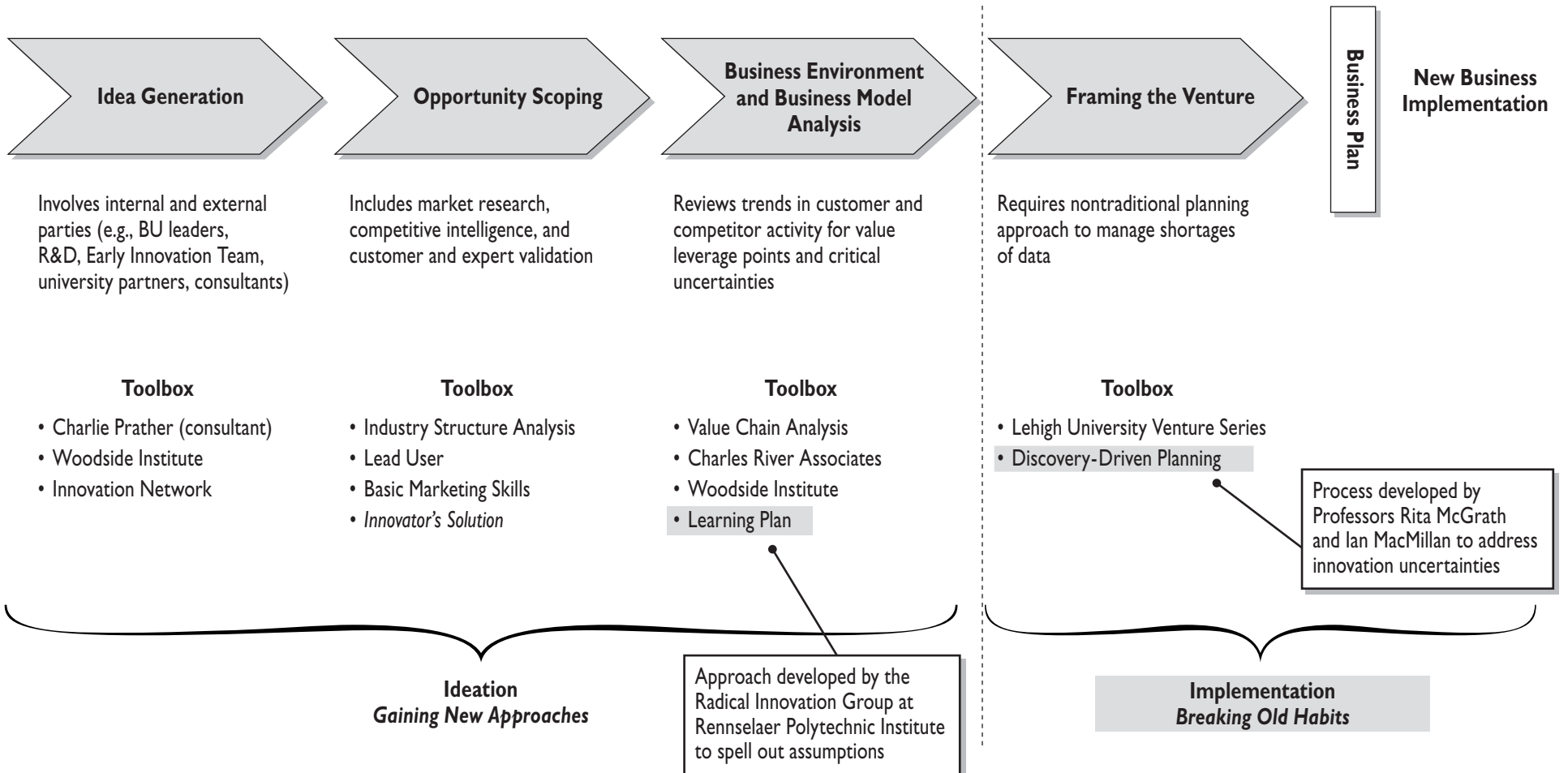
*Learning Plan*—Originally developed in the late 1990s, by the Radical Innovation Group of professors at Rensselaer Polytechnic University, the learning plan methodology instills discipline around disaggregating strategic assumptions and mapping methods to resolve critical uncertainties underlying proposals for white-space innovation.

*Discovery-Driven Planning*—Originally developed in the mid-1990s by Columbia Business School professor Rita Gunther McGrath and Wharton Business School professor Ian MacMillan, the discovery-driven planning methodology makes explicit the financial metrics for an innovation to be considered successful and uses those financial criteria to help prioritize project investments based on the investment's ability to discover evidence that supports or refutes strategic assumptions.

# RADICAL INNOVATION REQUIRES NEW TOOLS

**Drawing Together a Variety of Tools, Air Products Finds That Framing a White-Space Venture's Business Plan Requires the Most Significant Cognitive Shift**

White-Space Innovation Process  
Air Products, 2004



Source: Air Products and Chemicals, Inc.; Corporate Strategy Board research.

## TOOLS APPROPRIATE TO THE TASK

### Backward-Looking Business Planning Methods

Most companies reap disappointing returns from their investments in new businesses because the tools companies typically apply fail to build reliable business plans in unfamiliar or not-yet-existing markets.

The conventional approach to business plan construction serves core business investments well because it offers a rigorous discipline for connecting the data already possessed by the company to a standardized template for comparing proposals. Unfortunately the strengths of the approach for the core business become drawbacks when applied to white-space opportunities that by their nature lack the internal, historical data from which to extrapolate cost and revenue estimates.

Most investment proposals within the core business share similar assumptions about suppliers, consumers, and internal operational capabilities, among others. When making funding decisions, senior executives understand these assumptions and can compare a business plan's promises to their own experiences.

In trying to construct the conventional business plan, most companies mistakenly fund and implement projects that actually have negative net present value (NPV) because the business plan failed to consider the strategic assumptions most critical to future success and instead revisited the variables that created prior success for the core.

To make the white-space opportunity fit into the conventional methodology, project leaders consciously or inadvertently mask the greatest uncertainties underlying a white-space opportunity—how it most differs from core business investment opportunities.

### Forward-Looking Planning That Embraces Discovery

Unlike conventional methods, Air Products seeks to expose—not paper over—holes in its data, in order to bring critical assumptions to the fore where they can be more easily debated, researched, and tested.

The learning plan disaggregates uncertainties to get a comprehensive sense of what is known and yet unknown about an opportunity. The reverse income statement applies financial discipline to precisely define performance success criteria that an opportunity would need to deliver to be worth diverting the organization's resources. The strategic assumptions list integrates the uncertainties from the learning plan and the performance criteria of the reverse income statement to prioritize assumptions based on their materiality to the project hitting its financial targets. The learning-based milestones approach reconceives the traditional operational project plan to instead focus on testing the most influential strategic assumptions first, before accelerating investments in more predictable, but less material-to-success aspects of the project.

Together these tools allow Air Products to kill flawed projects sooner and with less investment, thereby freeing resources toward accelerating those projects most able to support their strategic assumptions with fresh evidence.

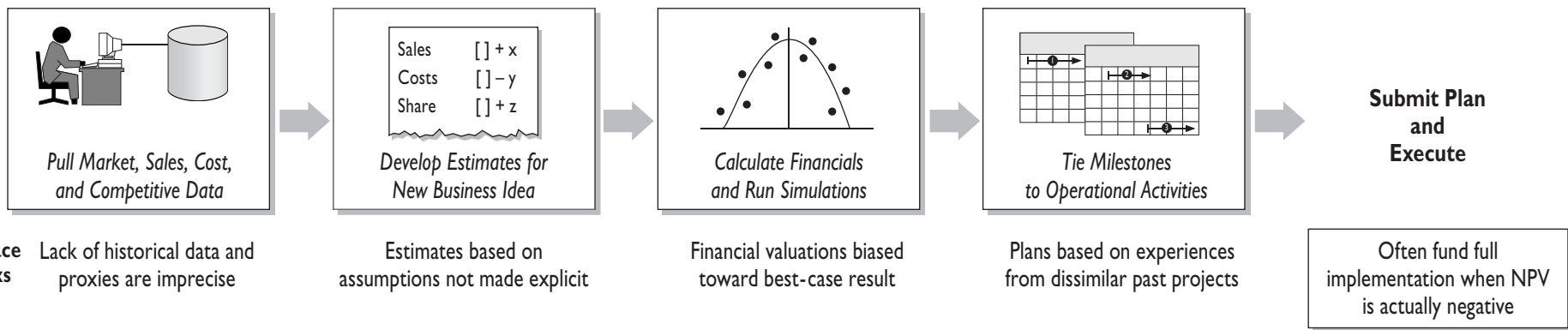
#### **Member Takeaway**

*Sequence new business building activities to reduce the greatest uncertainties first—any money not spent on reducing those uncertainties is probably wasted.*

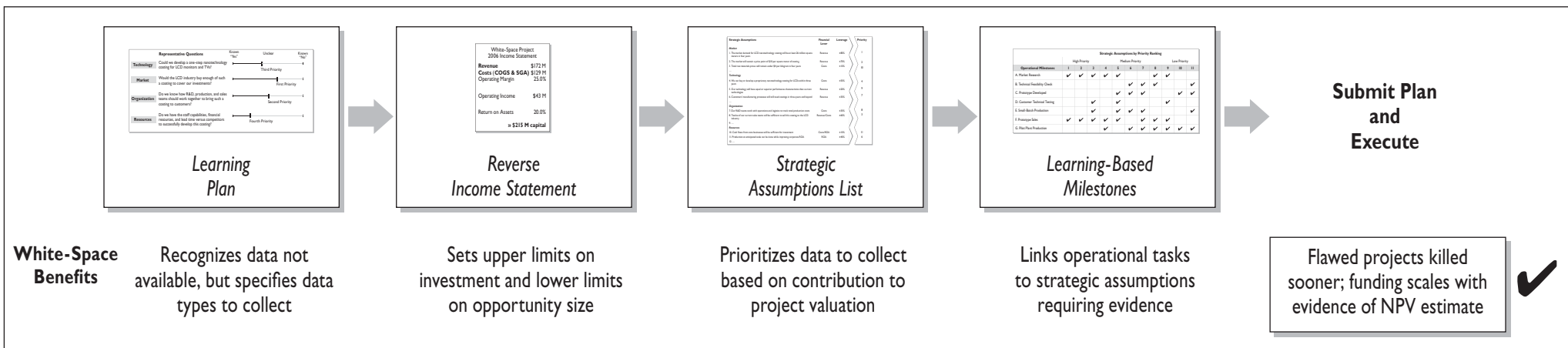
# NOT MASKING, BUT CONFRONTING UNCERTAINTIES

**Recognizing Traditional Business Plan Creation Miscalculates White-Space Opportunities, Air Products Creates Plans to Resolve Project Uncertainties Without Overinvestment**

## Conventional Business Plan Construction



## Air Products' Approach to Planning New Businesses



Source: Air Products and Chemicals, Inc.; Leifer, Richard et al., *Radical Innovation*, Harvard Business School Press: Boston, 2000: 63–65; McGrath, Rita Gunther and Ian MacMillan, *The Entrepreneurial Mindset*, Harvard Business School Press: Boston: 231–266; Corporate Strategy Board research.

## UNDER THE SURFACE

### **Proud to Be Ignorant, but Eager to Learn**

When moving beyond an initial concept for a white-space innovation, Air Products first engages in a learning plan to disaggregate and make explicit the assumptions underlying the idea for a project proposal. The Early Innovation Team identifies data gaps against such dimensions as technology, market, organization, and resources required. By creating a list of questions that must be true for a project to succeed, Air Products surfaces critical uncertainties that could derail a project. Often, this process reveals that those aspects of a project that would typically have received the most attention and investment, such as the technological feasibility of an idea, are more certain than the market or organizational dimensions.

Air Products assembles a learning map listing the 10 to 20 questions most critical to the success of the new business idea. The team gives each question a preliminary “best guess” answer and prioritizes its list based on the degree of uncertainty in those initial answers. Supplemental data or market research, especially from external sources, then helps the team take a first step toward reducing those uncertainties and planning areas for in-depth examination.

### **Making Uncertainties Explicit to the Organization**

Mapping uncertainties across multiple dimensions yields powerful results quickly. This exercise can identify insurmountable barriers to project success earlier than traditional development approaches, which would not discover such barriers until an expensive, mid-project operational milestone. Additionally, making these uncertainties explicit at the start of a project clarifies to senior decision makers the critical organizational and resource commitments necessary in order to pursue the financial benefits of building the proposed new business. This enables senior executives to review the portfolio of growth options and make trade-offs before starting projects the organization has no capacity to finish.

# KNOWING WHAT YOU DO KNOW AND DON'T KNOW

## Learning Map Exercises Disaggregate Uncertainties to Highlight Critical Success Factors

Learning Map for White-Space Opportunity in Nanotechnology

Air Products, Illustrative

### I. Identify Data Gaps



- Early Innovation Team with cross-functional participation brainstorms unanswered project questions against four dimensions: market, technology, organization, resources
- Questions focus on elements related to investments required or anticipated returns
- List trimmed to the 10 to 20 questions most influential to project success

### 2. Score Each Item by Degree of Uncertainty and Rank by Distance from “Yes”

	Representative Questions	Known “Yes”	Unclear	Known “No”
<b>Technology</b>	Could we develop a one-step nanotechnology coating for LCD monitors and TVs?	----- -----	----- ----- Third Priority	----- -----
<b>Market</b>	Would the LCD industry buy enough of such a coating to cover our investments?	----- -----	----- ----- First Priority	----- -----
<b>Organization</b>	Do we know how R&D, production, and sales teams should work together to bring such a coating to customers?	----- -----	----- ----- Second Priority	----- -----
<b>Resources</b>	Do we have the staff capabilities, financial resources, and lead time versus competitors to successfully develop this coating?	----- -----	----- ----- Fourth Priority	----- -----

**“Failing” Early**  
Learning map discussions can highlight insurmountable barriers—questions clearly “no”—before project implementation

### 3. Recheck Data and Seek Additional Input



- Priorities**
1. Market
  2. Organization
  3. Technology
  4. Resources

- Likely “no” answers should be checked first as hurdle to further investment
- Outside experts, customer interviews, or focused market research can clarify critical questions

Source: Air Products and Chemicals, Inc.; Leifer, Richard et al., *Radical Innovation*, Harvard Business School Press: Boston, 2000: 63–65; McGrath, Rita Gunther and Ian MacMillan, *The Entrepreneurial Mindset*, Harvard Business School Press: Boston: 231–266; Corporate Strategy Board research.

## REVERSE INCOME STATEMENT

### Finding Numbers to Trust

The lack of analogous internal data, the tendency to accept optimistic external estimates, and the temptation of project supporters to game forecasts lead many companies to approve projects that have unreliable valuations. Alternatively, many other firms lack faith in the process and overcompensate by holding white-space proposals to unattainably high hurdle rates of return. The first instance produces much wasted corporate investment and the second prevents an organization from expanding its growth options.

Air Products wisely recognizes the limitations of financial forecasting for white spaces and performs a jujitsu of sorts, turning that weakness into a strength for project evaluation and planning. Air Products defines a priori what would be a sufficiently material contribution to the company's financial results to warrant any effort of committing to an unfamiliar venture. This method removes incentives to game forecasts and instead provides guidance toward linking critical uncertainties to strategic assumptions of competitive and operational performance for which evidence can be gathered. The reverse income statement tool enables early rejection of uneconomic projects and provides investment cap guidelines that can be trusted to prevent overcommitment of resources during development.

### Starting with Success and Deriving Project Constraints

The Early Innovation Team constructs a “reverse income statement” that works backward from the growth objectives of the organization to calculate a white-space innovation's required revenues at maturity and upper thresholds for operating costs and capital investment. In this way, the advocates for an idea can see at a broad level what competitive results the new business must achieve in exchange for a limited amount of investment. When senior executives set the materiality thresholds upfront, it enables easily tested “sanity checks” that cull some financially untenable projects up front, before committing significant investment.

The choice of material thresholds should reflect the portfolio ambitions of the overall company and its long-term strategy. To maximize shareholder value, most firms would set thresholds to target more economically attractive markets than their core market—thresholds typically requiring substantial net income growth and improvement in operating margins and returns on assets to make a white-space opportunity worth pursuing. In some cases, such as for firms already in high-margin industries, attractive new businesses opportunities may only exist that can create value by trading one dimension against another—quick income growth, but margin dilution, for example.

### *Member Takeaway*

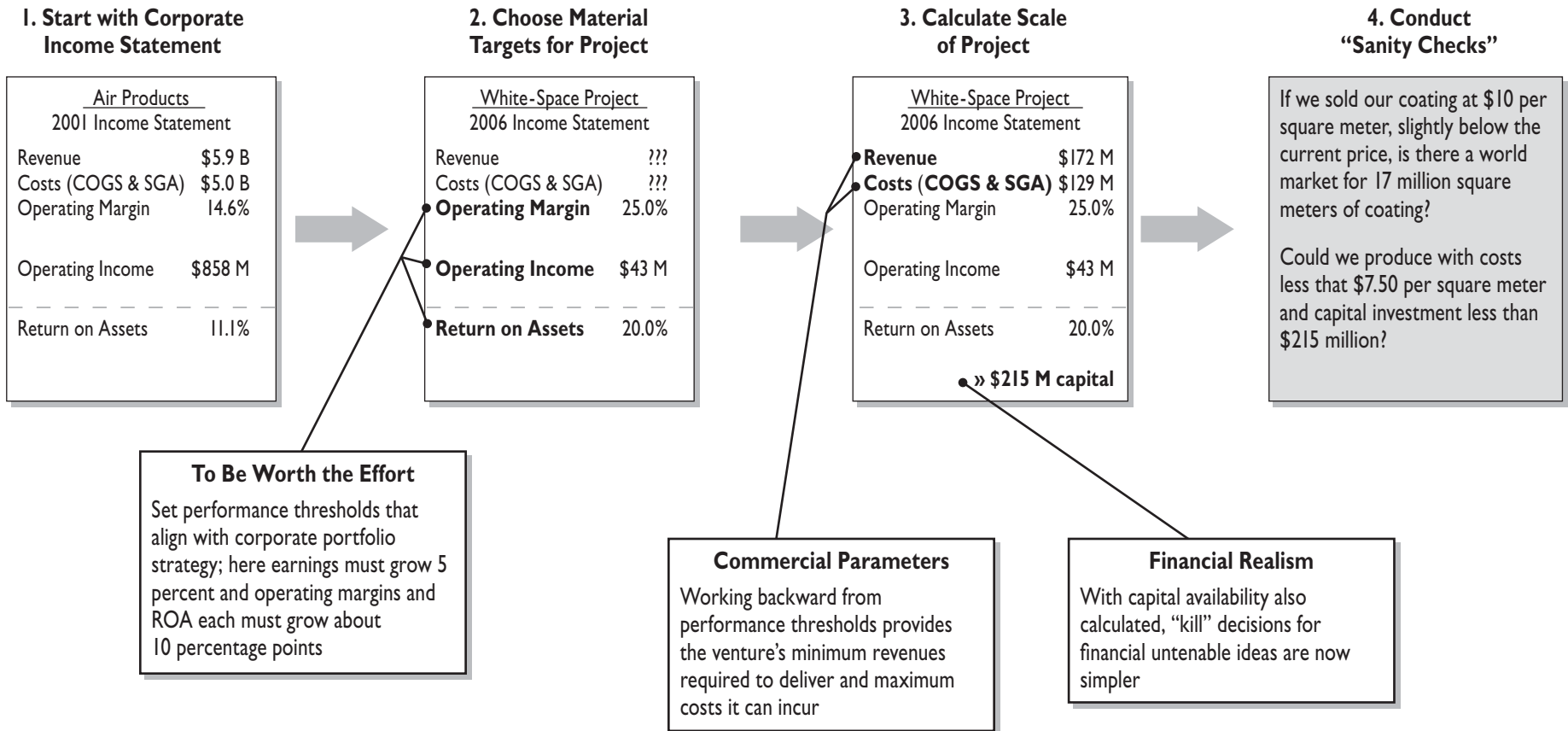
*Set material thresholds for improving corporate financial performance and calculate backward a white-space project's “must achieve” financial performance criteria to test the project's critical strategic assumptions.*

# WHAT VICTORY LOOKS LIKE

**Applying a Reverse Income Statement Approach Defines Financial Constraints for the Project to Materially Succeed**

Reverse Income Statement for White-Space Opportunity

*Air Products, Illustrative*



Source: Air Products and Chemicals, Inc.; Air Products and Chemicals, Inc., *2003 Annual Report*, p.21; McGrath, Rita Gunther and Ian MacMillan, *The Entrepreneurial Mindset*, Harvard Business School Press: Boston: 231–266; Corporate Strategy Board research.

## EXPLICIT ASSUMPTIONS

### Connecting Learning and Financial Performance

While all of the uncertainties from the learning plan are critical to the project's success, they are not equally critical or equally uncertain. Combining the critical uncertainties from the learning plan and the performance thresholds of the reverse income statement, Air Products generates a list of strategic assumptions that must hold true for the project to succeed financially. The strategic assumptions list process reframes the uncertainties as specific, testable hypotheses connected to the financial target or targets that each assumption effects.

By using the prioritized strategic assumptions list, Air Products knows which uncertainties to attempt to reduce first through investment of staff and resources. As the team learns more, it will reevaluate its estimates and recalculate its prioritizations until the white-space innovation has failed a critical test or the project become sustainable enough to transfer to traditional corporate oversight beside the core lines of business.

While initial estimates of influence are likely to be broad and not especially accurate, the importance ranking of the assumptions relative to one another is less likely to change than the absolute values of the financial estimates themselves. This technique offers direction in a terrain where experience provides no guide.

### Quantifying Uncertainties

For each assumption, the Early Innovation Team will quantify the influence on that target, or the range of variation in the value from the reverse income statement that could be expected by the assumption being true or false. This influence estimate combines the actual contribution of the assumption with its current degree of certainty. For a hypothetical example, if the white-space innovation requires particular raw materials to contribute 40 percent of total costs for a project and because of reliable pricing history for this material there is only 25 percent uncertainty in the assumption, then the influence on meeting the cost target is plus or minus 10 percent (the product of the two values). After making such estimates across the set of 10 to 20 assumptions, the team can then rank the assumptions by their degree of influence. This prioritization then guides investment toward reducing the uncertainty values for the greatest contributors to financial success.

#### **Member Takeaway**

*Frame your assumptions by what must be true for the venture to succeed and then rank them by your uncertainty about meeting financial targets—revisiting and recalculating rankings as you learn more about the opportunity.*

# CLARIFYING ASSUMPTIONS AND PRIORITIZING BY POTENTIAL IMPACT

**Qualitative Questions and Quantitative Targets are Combined to Generate Strategic Assumptions Requiring Supporting Evidence for the Project to Advance**

## Strategic Assumptions List Process

*Air Products, Illustrative*

### 1. Combine Learning Plan Priorities with Reverse Income Statement Parameters

Representative Questions	Known "Yes"	Unclear	Known "No"
<b>Technology</b> Could we develop a one-step nanotechnology coating for LCD monitors and TVs?		Third Priority	
<b>Market</b> Would the LCD industry buy enough of such a coating to cover our investments?		First Priority	
<b>Organization</b> Do we know how R&D, production, and sales teams should work together to bring such a coating to customers?		Second Priority	
<b>Resources</b> Do we have the staff capabilities, financial resources, and lead time versus competitors to successfully develop this coating?		Fourth Priority	

White-Space Project 2006 Income Statement	
Revenue	\$172 M
Costs (COGS & SGA)	\$129 M
Operating Margin	25.0%
Operating Income	\$43 M
Return on Assets	20.0%
» \$215 M capital	

Early Innovation Team generates measurable, strategic assumptions that must be true for project to hit targets and succeed

### 2. Estimate Assumption Uncertainties and Influence on Financial Levers

Strategic Assumptions	Financial Target	Influence on Target	Priority
<b>Market</b>			
1. The market demand for LCD nanotechnology coating will be at least 17 million square meters in five years	Revenue	±80%	1
2. The market will sustain a price point of \$10 per square meter of coating	Revenue	±70%	2
3. Total raw materials prices will remain under \$4 per kilogram in four years	Costs	±10%	10
...			
<b>Organization</b>			
4. Our R&D teams work with operations and logistics to track total production costs	Costs	±30%	8
5. Twelve of our current sales teams will be sufficient to sell this coating to the LCD industry	Revenue/ Costs	±60%	3
6. ...			
<b>Technology</b>			
7. We can buy or develop a proprietary nanotechnology coating for LCDs within three years	Costs	±50%	4
8. Our technology will have equal or superior performance characteristics than current technologies	Revenue	±20%	9
9. Customers' manufacturing processes will still need coatings in three years and beyond	Revenue	±30%	7
...			
<b>Resources</b>			
10. Cash flows from core businesses will be sufficient for investment	Costs/ROA	±10%	11
11. Production at anticipated scale can be done while improving corporate ROA	ROA	±40%	6
12. ...			

- If market size assumption is only 20% certain, it can influence the revenue target by 80%
- However, an assumption about raw materials may only affect a fraction of the costs target

Source: Air Products and Chemicals, Inc.; McGrath, Rita Gunther and Ian MacMillan, *The Entrepreneurial Mindset*, Harvard Business School Press: Boston: 231–266; Corporate Strategy Board research.

## LEARNING-BASED MILESTONES

### Rigidity of Traditional Project Plans

Having prioritized strategic assumptions by their influence on a project's financial performance, Air Products can reconsider the traditional operational milestones and their typical order to instead emphasize learning-based milestones that scale investments in a project to match reductions in the uncertainty of the project's net present value.

While conventional project planning recommends pursuing activities in parallel in order to speed to completion, that model assumes a much higher degree of certainty than holds true for white-space innovation. Traditional project plan milestones emphasize operational and technical hurdles rather than other dimensions that may determine success, because for core business investments, the operational is the least certain aspect. Companies that apply such a model to white-space opportunities often find disappointment when high-cost technological investments lead to original products that unfortunately customers find irrelevant or too expensive, for example.

Aware of the potential pitfalls when exploring unfamiliar markets and value propositions, Air Products pursues a more flexible approach to project planning that prizes investment efficiency over speed to completion.

### Customizing Investment Plans

The Early Innovation Team focuses its resources on gathering evidence for a project's most critical assumptions and postpones investment in less critical assumptions, where possible. For a hypothetical example, if tabulating the typical order of operational milestones against a project's strategic assumptions reveals that high priority assumptions about customer receptivity and price points will not be tested until late in the standard development process, then steps would be reordered to pull forward some transactional learning and delay some technical investments until the team has collected more evidence of a positive market response.

For white-space opportunities, no single investment is likely to provide complete certainty around a strategic assumption (unless to disprove it), therefore learning-based milestones will seek to provide multiple checks for each assumption. For example, market research may reduce the uncertainty of your initial estimate of the size of the customer base by only 20 percentage points, but prototype sales may reduce it by an additional 40 percentage points. Those milestones that do seem to falsify a critical strategic assumption should be triggers for an immediate discussion of ending a project and reallocating resources elsewhere in the portfolio, remembering that high white-space failure rates are to be expected and are acceptable if costs-per-project can be minimized.

### **Member Takeaway**

*At any time, investments should be directed against those most financially influential remaining assumptions with most assumptions being tested and refined multiple times, in order to collect evidence that justifies further investment.*

# PLANNING TO LEARN

**Strategic Assumptions Are Mapped to Operational Milestones and Plans Are Revised Based on Learning Required**

Learning-Based Milestones

*Air Products, Illustrative*

Operational Milestones	Strategic Assumptions by Priority Ranking										
	High Priority			Medium Priority				Low Priority			
	1	2	3	4	5	6	7	8	9	10	11
A. Market Research	✓	✓	✓	✓	✓			✓	✓		
B. Technical Feasibility Check						✓	✓	✓			✓
C. Prototype Developed					✓	✓	✓			✓	✓
D. Customer Technical Testing			✓		✓				✓		
E. Small-Batch Production			✓		✓	✓	✓				✓
F. Prototype Sales	✓	✓	✓	✓	✓		✓	✓	✓		
G. Pilot Plant Production				✓		✓	✓	✓	✓	✓	✓

### Reordering

Mapping assumptions shows that reordering milestones should save expensive technical investment until greater evidence of market need has been demonstrated



### Transactional Learning

Forward contracts based on potential product features with small cancellation penalty could enable prototype sales without product

### Multiple Checks

Each strategic assumption (e.g., market will sustain \$10/m<sup>2</sup> price point) is tested multiple times as new data helps revise estimates

Source: Air Products and Chemicals, Inc.; McGrath, Rita Gunther and Ian MacMillan, *The Entrepreneurial Mindset*, Harvard Business School Press: Boston: 231–266; Corporate Strategy Board research.

## WHITE SPACES MADE REAL

### Accepting, Then Fighting Ignorance Can Be Bliss

Since committing to developing white-space innovations in 2002, Air Products already sees some early benefits from applying its unconventional methodology for framing and implementing new business ventures. The primary strength of the process so far has been to highlight barriers to project success sooner than they would otherwise have appeared and in time to avoid making investments that would never have paid back their costs.

On the new revenue side, investments in nanotechnology-related projects have already started to make contributions, for example. Recognizing that the white-space opportunities aim to show returns in the long-term, three to six years out, beyond the period business units typically consider, Air Products can already attribute some material revenue growth to early innovations. These white-space innovations align with and support the company's identified growth platforms in electronics, performance materials, hydrogen/energy solutions, and health care.

Additionally, executives' appreciation of the logic of pulling investment uncertainties into the open for exploration and evaluation has led Air Products to expand the training in and use of the methodology to considerations beyond just white-space opportunities, to other business investments such as geographic expansion or pursuit of an adjacency—areas with relatively lower, but still significantly high uncertainties of success.

### Aggressive Pruning Helps Grow Roses

By making assumptions explicit and prioritizing investments to reduce uncertainties in a white-space project's valuation, Air Products can incubate new businesses more efficiently and pursue a more robust portfolio of products than those companies applying core business planning tools to their new business building efforts.

Learning how to “fail fast, cheaply” enables a company to endure the inherently low-yield process of finding sustainable white-space ideas while still delivering a material pipeline of new revenue streams—a pipeline with positive returns on investments of incubation resources. For each project that is killed for good cause early, the team searching for opportunities gets smarter about diagnosing critical uncertainties and collects resources that can be reallocated toward the projects with the greatest evidence supporting their strategic assumptions, thereby pulling break-even points sooner in the development cycle.

### **Member Takeaway**

*To free up resources to accelerate the most promising white-space projects, identify and kill “bad” projects sooner by making the reduction of critical uncertainties the primary basis for measuring incubation progress.*

# THINKING BIG ABOUT THE VERY SMALL

## **Air Products Uses Discovery-Driven Planning to Help Narrow Its Focus to the Most Promising Opportunities in Support of Company New Growth Platforms**

### Benefits of Strategic Assumptions Prioritization

*Air Products, Illustrative*

#### — SAVING YEARS OF WORK —

“By going through the process of creating a reverse income statement, it forced me to go much deeper into parts of the business and find out about issues much earlier. Without this, we could have been working on this for two years without finding out and addressing potential concerns.”

Nancy Easterbrook  
Business Development,  
Manager  
Air Products

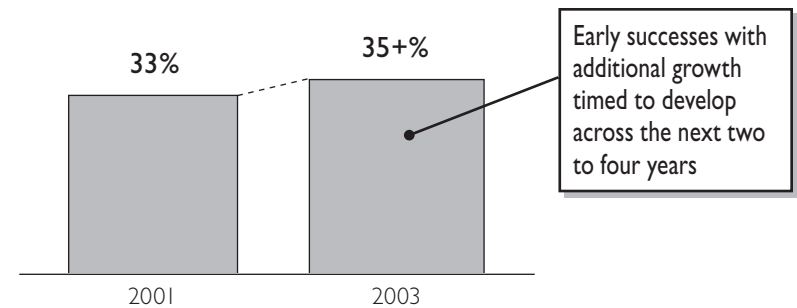
#### — INVESTING IN THE FUTURE —

“About two years ago, we began to explore the nanotechnology space to think about how it might play a role in Air Products, given our skills, capabilities, and market channels. We have already completed one venture investment in a startup in this space, with a technology for producing nano particles of metals and oxides.”

Ron Pierantozzi  
New Business Development,  
Director  
Air Products

### Percentage of Revenues from Growth Platforms\*

*Air Products, Illustrative*



\* Electronics, performance materials, hydrogen/energy solutions, and health care.

Source: Air Products and Chemicals, Inc.; Wharton@Work, “Using Discovery-Driven Planning to Drive Business Development at Air Products,” February 2004, <http://exceed.wharton.upenn.edu/ebuzz/0402/thoughtleaders.html>; Air Products and Chemicals, Inc., 2003 Annual Report, p. 6; Corporate Strategy Board research.