Renewables II Study

Consolidation in the global solar cell and module market: separating the wheat from the chaff

October 2009

goetzpartners

Executive Summary

The wheat gets separated from the chaff. This is the result of an analysis of 100 international solar cell and module manufacturers. goetzpartners has analyzed the financial ratios as well as market data and extrapolated them to planning scenarios up to 2015.

- The global solar cell and module market is currently under pressure both from internal market drivers and capital markets: tremendous overcapacities and declining module prices on one side, a major value gap between investors' expectations and fundamental values with shrinking multiples within the last year on the other side.

- goetzpartners predicts that by 2015, the solar market will be characterized by drastic consolidation effects: the number of solar cell and module producers will be reduced by 40%.

- Additionally, the market share of the top 10 will increase from 44% today to 57% in 2015. Only those companies will be among the long-term winners who consequently use their already strong strategic and/or financial position to further expand their competitive advantages and actively take part in the consolidation process.

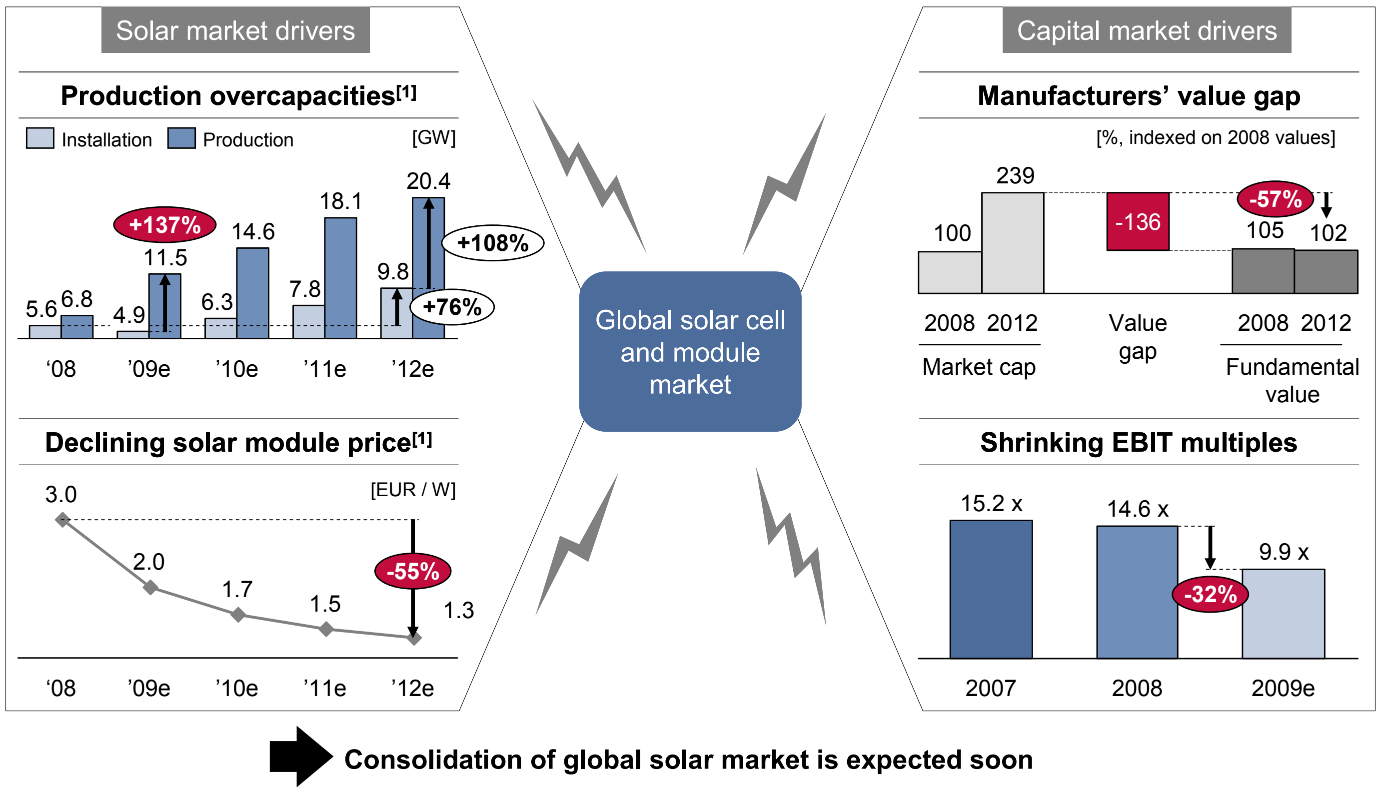
- During the consolidation process market participants will be placed into one of the following five strategic positions:
  - The "Happy Bachelor" / "Happily Married"
  - The "Newly Rich"
  - The "Second"
  - The "Prom Queen"
  - The "Cinderella"

- For each strategic position goetzpartners recommends norm strategies (organic growth, alliances, inorganic growth, look for investors, exit) in order to maximize value.

- Independent of the norm strategies these players will need to select a clear deal rationale. They will also have to make a choice out of seven value drivers and clearly define their value creation potential.

The global solar cell and module market is currently under pressure both from internal market drivers and capital markets

Solar and capital market drivers



[1] Refers to crystalline and thin film photovoltaics; spot prices weighted by volume

Sources: goetzpartners, Thomson ONE Banker, Photon, Sarasin, Deutsche Bank, EPIA, LBBW

Changing market conditions will force solar players to reposition themselves

Development of the global solar cell and module market – goetzpartners view

State of the solar cell and module market

1 Drastic financing costs will not be covered

Historic growth was mainly leveraged by debt financing. Due to decreased income streams, companies are no longer able to afford debt burden for additional capacity expansion

2 Short-term bankruptcies will occur

Not all players can keep up with competitors' technology advances and price cuts – they are confronted with difficult cash flow situations and get more and more trapped in debt cycle

3 Large players have clear advantages

Due to superior cost efficiencies and market access, large players can cope with declining prices longer

Influence of the capital market

4 Fastest way to meet demands is M&A

Inorganic growth enables companies to grow according to capital markets' extraordinary growth expectations – due to minimized ramp-up time and faster assimilation of know-how and resources

5 Now is the right time to buy

Contrary to capital markets' past and future expectations, current valuations are fair and reflect a realistic market growth

6 Implicit pressure is built up

As soon as one player grows every other player is put under pressure to achieve competitive edges

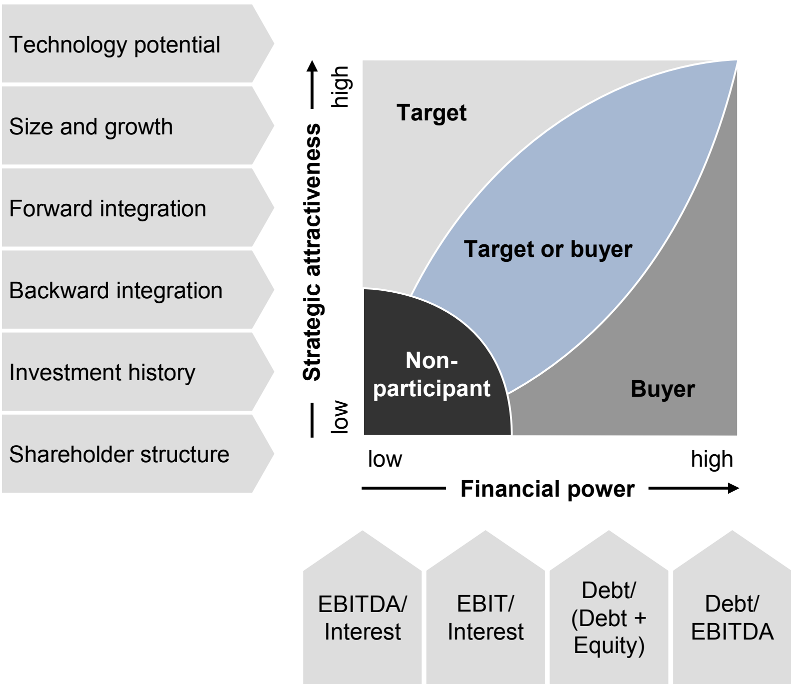
→ **Consolidation wave will start – and continually gain speed**

Source: goetzpartners

goetzpartners carried out an in-depth analysis of 100 global companies to prove the consolidation hypothesis

goetzpartners' consolidation model

Logics and input dimensions



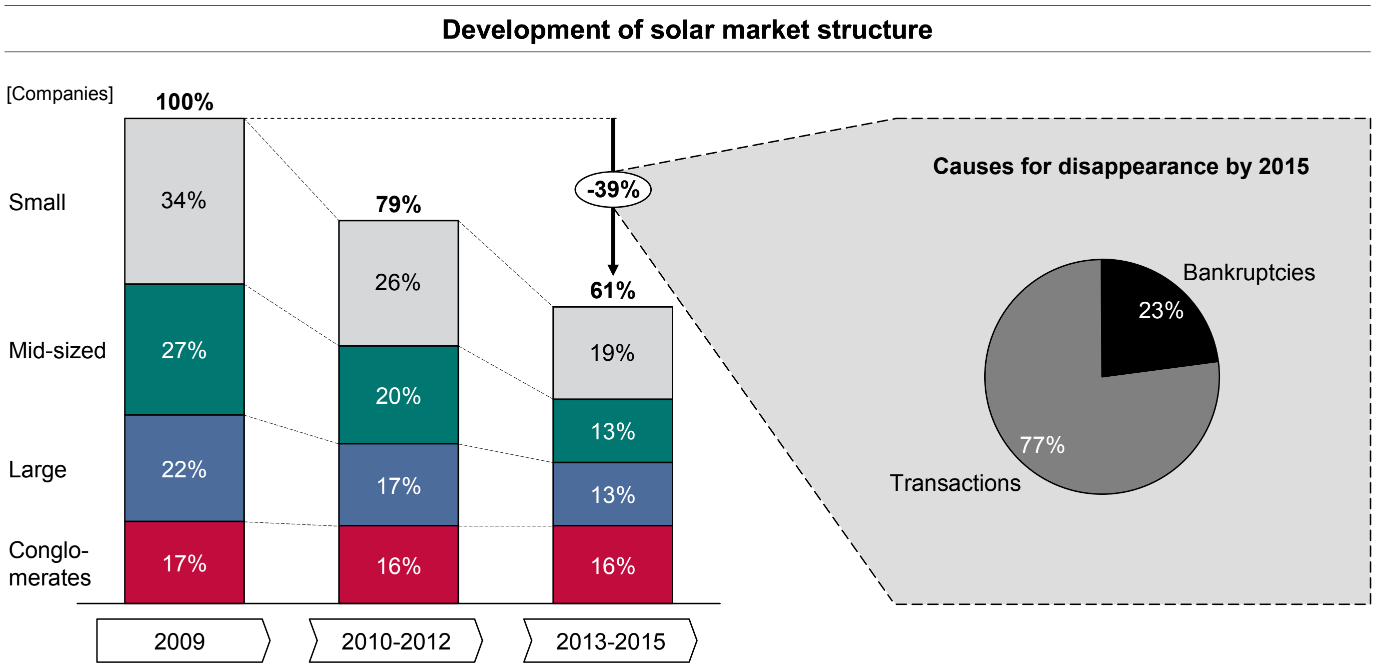
Approach

- 100 solar cell and module manufacturers have been evaluated
- The evaluation builds on the key areas for competitive edges and the companies‘ financials
- Players‘ financial data is simulated up to 2015 based on 2008 performance data and recent market movements
- Companies with an “urgency” (i.e. high financial power and little strategic attractiveness) buy first
- Attractive companies with little financial power are acquired first
- Two main phases are taking place:
  - 2010-2012: 1st consolidation wave
  - 2013-2015: 2nd consolidation wave

Source: goetzpartners

40% of the 2009 cell and module manufacturers will disappear by 2015

Development of solar market structure from 2009 to 2015 – simulation



Conglomerates and large independent solar players will drive the imminent consolidation

Sources: goetzpartners, Thomson ONE Banker, Company Statements

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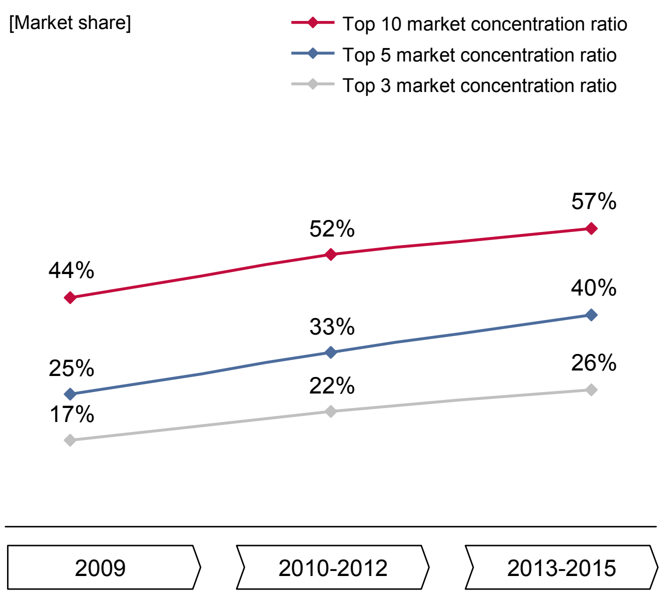
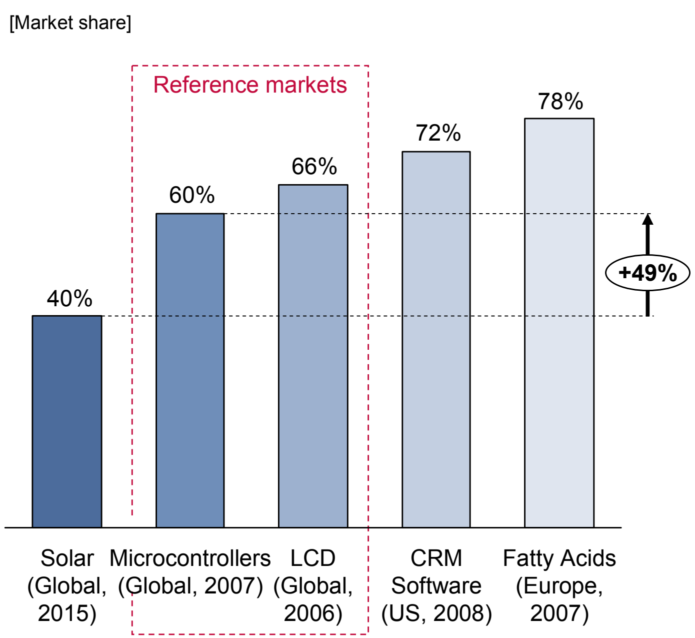
A few market participants will cement their top position over the next years

Development of solar market concentration 2009 - 2015

Development of market concentration



Top 5 concentration ratios in other markets



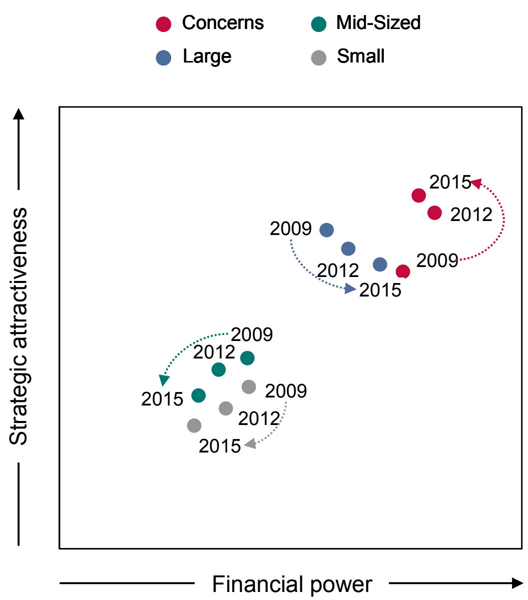
Despite a huge increase in market concentration, there still exists upside potential for further consolidation from 2015 on

Sources: goetzpartners, Thomson ONE Banker, Company Statements, Frost & Sullivan

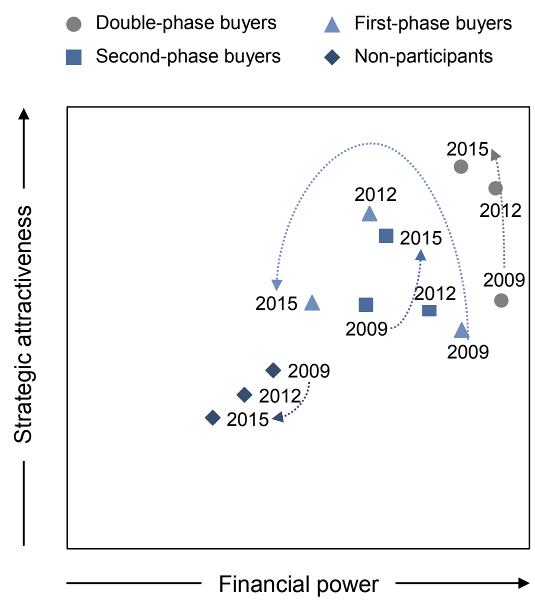
The winners will have prepared for continuous improvement at an early stage

Development of positions in the solar market

Market position development per company cluster



Market position development per player class

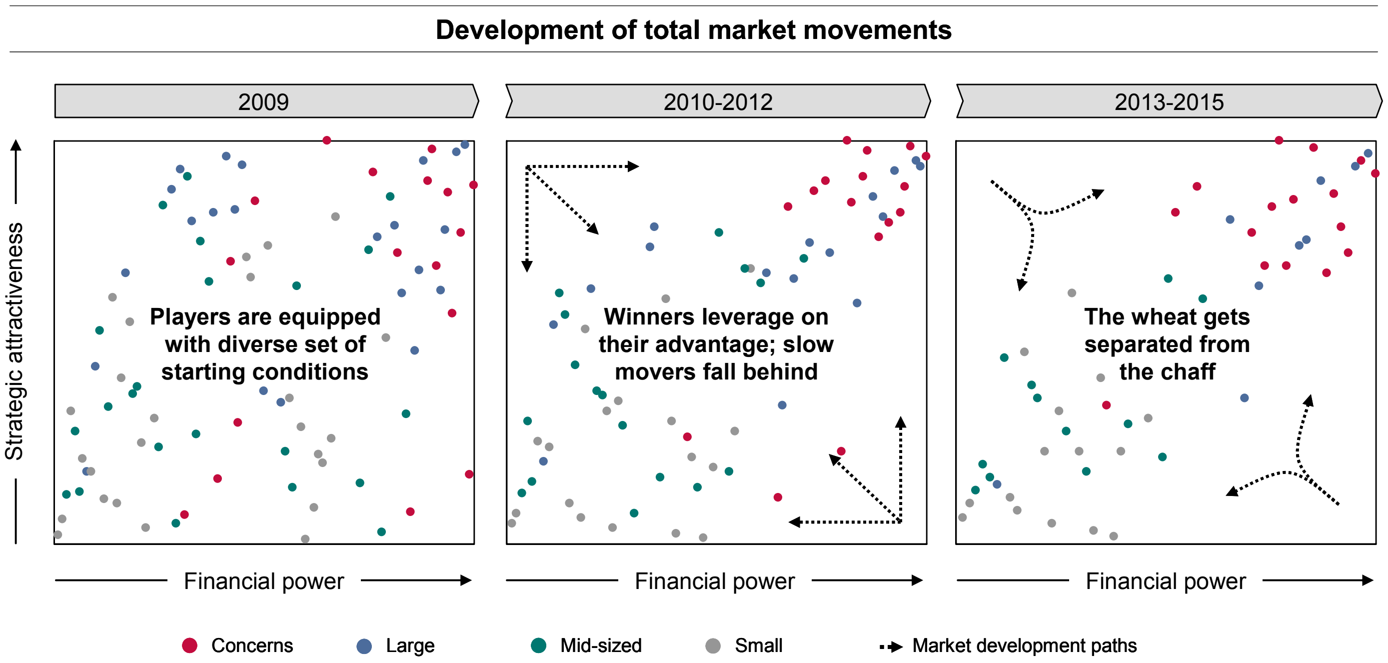


Companies driving consolidation will improve their market position by creating long-term strategic and financial competitive advantages

Sources: goetzpartners, Thomson ONE Banker, Company Statements

In the long run, only companies with a strong strategic and financial position will survive

Development of total solar market movements 2009 - 2015

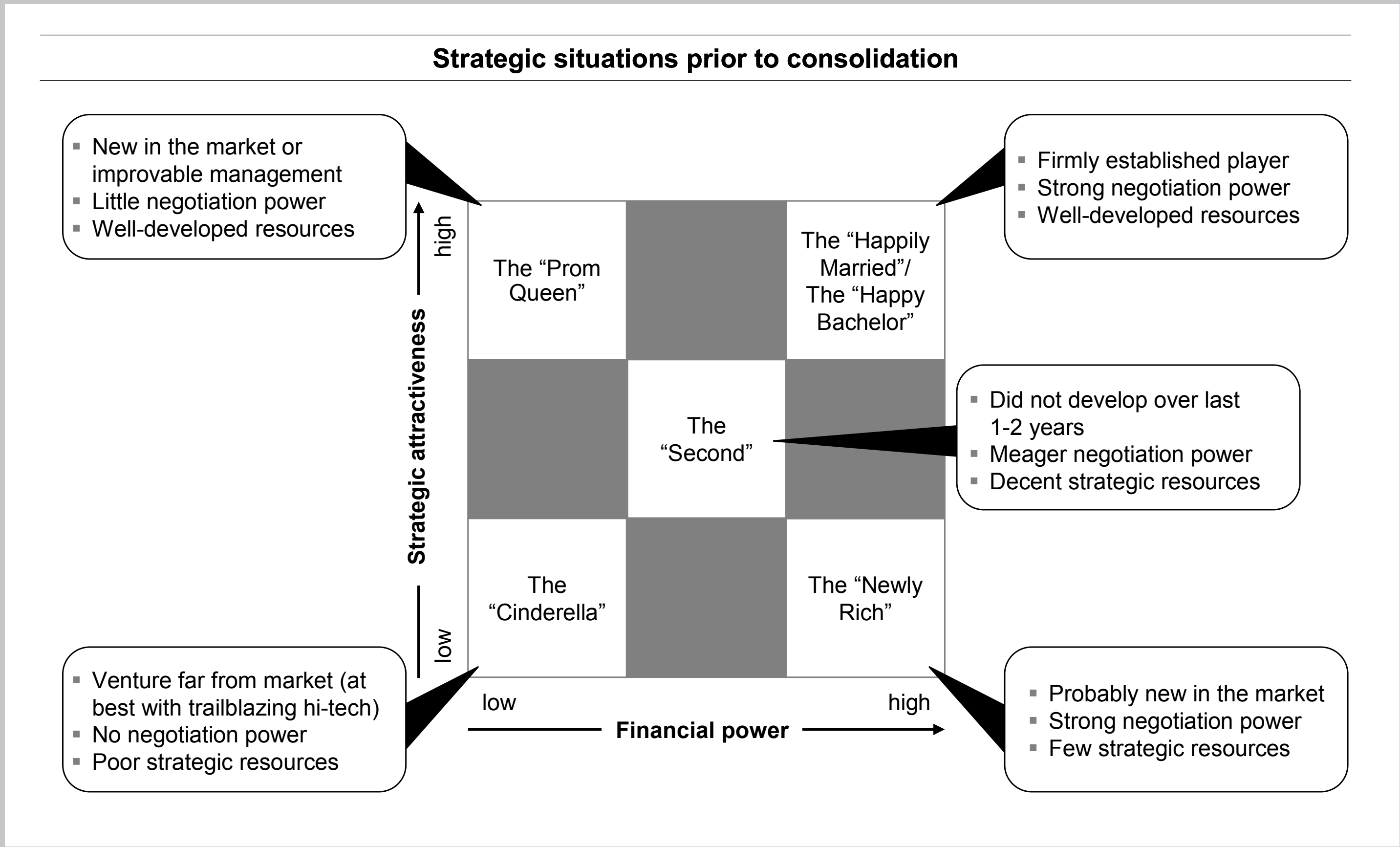


Long-term winners will use an already strong strategic and/or financial position to develop more competitive advantages

Sources: goetzpartners, Thomson ONE Banker, Company Statements

goetzpartners has identified 5 major situations players find themselves in today

Strategic positioning of players

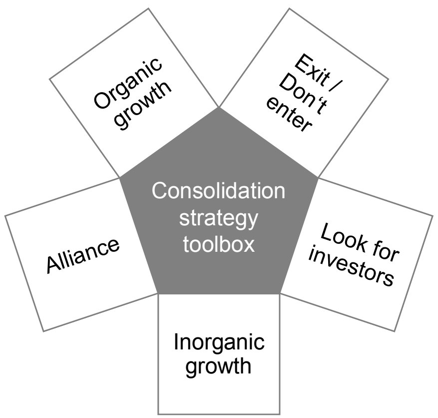


Source: goetzpartners

Every player has its optimal strategic approach during the inevitable consolidation

Strategic recommendations

Strategy toolbox



Primary strategy   Secondary strategy

Norm strategies to apply during consolidation

The "Newly Rich"
- Power loses value, thus move quickly
- No time and assets to grow internally
- Acquire (if impossible don't enter)

The "Happily Married"/ "Happy Bachelor"
- Use market power to cement position
- Close minor gaps by improving existing resources and acquiring sensibly
- Seek alliances with "Cinderellas"

The "Prom Queen"
- Seek investors to prevent buyout (and to acquire selectively closing gaps)
- Monetize internal capabilities quickly

The "Second"
- Invest internally to improve structures
- Ally with other "Seconds" to close gaps
- Seek investors to buy "Prom Queens"

The "Cinderella"
- Internal development alone will not suffice to improve relative to market
- Ally with "Happy Bachelors" (or else exit)

However, everyone should move with full speed

Source: goetzpartners

Every buyer needs a clear understanding of its deal rationale

Deal rationale drivers

1	**Critical sales mass**	Strong sales convey trust in long-term existence, thus generating further large-scale sales
2	**Wide sales base**	A widespread sales network yields unrestricted market access and logistical scale
3	**Wide procurement base**	Hedging supplier relationships ensures best purchasing conditions and raw material access
4	**Access to leading technologies**	Securing superior high-tech allows for cost and marketing improvements and diversifies risk
5	**Access to leading process know-how**	In contrast to providers using turn-key solutions, leaders will permanently seek trailblazing improvements on their processes
6	**Standardization power**	The larger a player the bigger its power to push ideas for standardization in order to achieve maximum cost advantages
7	**R&D scale**	The massive R&D expenses must be spread over as large a scale of shipments as possible

Deal rationale and added value to be defined and evaluated carefully

Source: goetzpartners

About goetzpartners

goetzpartners is one of the leading independent advisory firms in Europe, offering Corporate Finance and Management Consulting services under one roof. The group stands for an innovative consulting approach and tailor-made solutions that are successfully implemented together with their clients. goetzpartners has offices in Munich, Düsseldorf, Frankfurt, Zurich, London, Paris, Madrid and Prague as well as co-operations in New York, San Francisco, Los Angeles, Bangalore, Mumbai, Moscow and Budapest.

goetzpartners Management Consultants is specialized in the fields of strategy, organization, operational excellence, sales and marketing, restructuring and strategic due diligence. goetzpartners Corporate Finance focuses on M&A advisory services.

goetzpartners was classed a „Hidden Champion" 2009 in the fields of strategic due diligence, financial and merger strategies as well as post-merger integration (result of the latest "Hidden champion" study carried out by Professor Fink in collaboration with the magazine "Capital").

Industry Line Energy

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