



2015 PSMA POWER TECHNOLOGY ROADMAP

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Foreword

We hope you will find valuable information in this Power Technology Roadmap. This report, as well as all the previous roadmap reports in the series, is a result of the collaborative work by all volunteer participants. As such, we are very proud of and amazed by what has been accomplished. This report is unlike any other in the power technology industry and we hope the readers benefit from its many insights.

This report is the ninth Power Technology Roadmap. The first report was in 1994. The next report came out in 1997 and the cycle has been repeated every three years up to the 2009 report. As the report's influence has grown, we have been requested to increase the frequency of the report from our members to provide more up-to-date information to the power sources industry. As a result, this roadmap report is now being published every two years; in 2009, 2011, 2013, and 2015.

The Power Technology Roadmap is one of the benefits of your company's membership in PSMA. Please share this copy with others in your organization. If you or anyone in your organization is interested in additional copies of this report or any other PSMA publications, they can be purchased at psma.com or by calling the PSMA office.

Philosophy

The goal from its inception is to review, comment, and capture power conversion technology and trends for the next two to five years. As pointed out in previous reports, the consumers of power supplies, for the most part, are the original equipment manufacturers (OEMs). These are our customers and they buy our goods and influence the design and manufacture of them. Our customers are, in turn, influenced by their customers, who are usually the OEM end-users. With this in mind, it is clear that the power supply industry is not primarily technology driven. Rather, it is technology responsive. This is consistent with the role of the power supply in the broad spectrum of electronic products. In almost every case, the power supply plays a supporting role that, at best, enables and enhances the final products.

We are the recipients of lists of needs from our customers and these lists contain the features they need to be successful with their products. This is, of course, the force behind the statement about being technology responsive. The items on customer lists are full of technical challenges – smaller size, higher efficiency, better electrical performance, and lower cost. These requirements result in severe technical challenges in the design, manufacture, and even in the selling process. These challenges push all of us to strive for new levels of excellence in our respective businesses. We need better materials, better components, better solutions, and more effective ways to manufacture and deliver them. Our interests are best served by taking a proactive stance – by anticipating these challenges and developing the technology required to meet them on time or ahead of time.

It is in this spirit that the Power Sources Manufacturers Association (PSMA) has been conducting these Power Technology Roadmap activities since 1994. Leaders from the key groups – supply manufacturers, component suppliers, end users, and power industry experts – contributed their views on the trends in power technology in one-day workshops until the 2006 report.

Starting with the 2009, and continuing through the 2015 roadmap, the workshops have been replaced by a series of public webinar presentations conducted throughout the year to facilitate convenient attendance and the data gathering process. The webinars cover a wide range of power conversion topics loosely grouped into Power Architectures, Technology and Market Forces, and Components.

What's New This Year

The PSMA Power Technology Roadmap report looks for future trends. But how did the trends predicted in the past reports turn out? This year, a retroactive study is included to examine on how the past roadmap trends from 2003 to 2013 compared to the trends in this report. The results of this project are shown in Section V under the heading of “Power Technology Roadmaps – A Retrospective Survey”. It is an important and interesting look back at the past to help understand the micro-transitions that may turn into major inflection points in the future. Key results of this study will also be shared in the APEC2015 Plenary Session presentation (*see Section VII, Appendix VI*).

Other than this retroactive trends study, this year's 2015 roadmap report largely follows the format of and keeps the improvements made in the 2013 report.

Since the webinars have been opened to the public from the 2013 roadmap report, the attendance and interest level continues to grow. This also leads to interesting discussions at the end of the webinars between attendees of diverse backgrounds. We welcome these discussions and they contribute to how we understand our industry and the underlying power technologies. Sharing information and improving knowledge is, after all, the goal of PSMA.

We continue to include the recorded webinars on the USB drives. The webinars add much to the presentation materials because the listener can hear and understand the context and the subtext of the original presentation in the speaker's voice.

The 2015 roadmap report also keeps the two sections of written trend forecasts – Application Trends and Emerging Technology Trends. The reason to keep them separate remains: emerging technologies may not be application specific, although the boundaries can get blurry.

We continue to use an online survey to gather trends data for four power supply architecture segments. The increased participation has helped provide a more accurate picture of where we are today and forecast changes to expect for the next five years.

While the roadmap report looks to the future for power technology trends, we should also be cognizant of what came before. It is not possible to include the content of all the previous roadmap reports, but recognizing the previous work and topics discussed shows the evolution of topics and trends. We have provided a listing of the previous years' presentations and their authors in Appendix III. The printed reports from each year were sent to all PSMA member representatives at the time of publication and were offered for sale to non-members. Contact PSMA for the electronic copies of past roadmap reports.

The end result of all the webinars, surveys, and discussions is this report. It offers a consolidated view of the latest trends in the power management, power control, and power delivery technologies. We hope you find it useful, thought provoking, and valuable.

Aung Thet Tu and Eric Persson
Roadmap Chairs