Future Outlook (Part II)

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In this part of the book, an abridgement has been given of the technical work performed in Working Group 2 and 3 of COST action 291. The chapters summarize the most important results and give insight into the investigated aspects of optical transport networks, ranging from network planning to operation, from traffic engineering to resilience aspects, from fundamental network concepts to application scenarios.

The design targets of all these architectures as well as the metrics of their evaluation focus on the overall performance—the quality of the services with all their aspects and the amount of traffic, that is carried by the network—or vice versa the amount of resources required to carry a given traffic and to provide a certain grade of service. Furthermore, the studies only focus on selected parts of the networks, i.e. core or metro networks. This was driven by the operators' requirement to reduce the capital expenditures and operational cost as well as the network operation strategies. Nevertheless, with the change of the requirements and the provisioned services new topics are coming up and gain higher impact.

One of the most prominent these days is the power consumption. Buzzwords like Green IT are of universal concern. While for a long time the processing capacity of network nodes was limited by the power supply and thermal power loss, in the future, the network design must additionally consider the overall power consumption due to global warming as well as lack of energy. This will also gain impact on new metrics like the energy consumed per bit in *Joule per Bit*.

A second prominent topic is the convergence of optical networks. While backbone and core networks mainly rely on optical networks and new optical solutions are deployed in access networks, these networks are separated. To deliver end-to-end services with performance guarantees, the convergence of the distinct network solutions is necessary to accomplish an integrated optical platform. This leads to a unified control and management framework which allows convergence on different levels.