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Nota di contenuto	Introduction -- Research background -- Intermittently aerated membrane bioreactor technologies for nutrients removal and phosphate recovery -- Anaerobic hybrid membrane bioreactor technology for refractory organic pollutant removal -- Electrochemical membrane bioreactor technologies for sustainable wastewater treatment -- In-situ utilization of generated electricity to mitigate membrane fouling -- In-situ utilization of generated electricity for nutrient recovery -- Conclusion -- acknowledgement -- Academic papers and patents during doctoral studies.
Sommario/riassunto	The most commonly used biological wastewater treatment technologies still have serious technical-economical and sustainability-related limitations, due to their high energy requirements, poor effluent

quality, and lack of energy and resource recovery processes. In this thesis, novel electrochemical membrane bioreactors (EMBRs), which take advantage of membrane separation and bioelectrochemical techniques, are developed for wastewater treatment and the simultaneous recovery of energy and resources. Above all, this innovative system holds great promise for the ecient wastewater treatment and energy recovery. It can potentially recover net energy from wastewater while at the same time harvesting high-quality effluent. The book also provides a proof-of-concept study showing that electrochemical control might offer a promising in-situ means of suppressing membrane fouling. Lastly, by integrating electrodialysis into EMBRs, phosphate separation and recovery are achieved. Hence, these new EMBR techniques provide viable alternatives for sustainable wastewater treatment and resource recovery. .