The trend towards More-Electric Aircraft (MEA) and the introduction of new system technologies lead to considerable changes at the system level of commercial transport aircraft. Because the number of systems and power requirements are increasing, the consideration and integration of aircraft systems in early aircraft design phases is important. The objective of this contribution is to develop a characteristic flight mission with modelled aircraft systems to estimate the secondary power requirements. Therefore, a parameterized reference mission with typical altitude and speed profile of commercial transport aircraft is defined. Moreover, two baseline aircraft representing a Medium-Range (MR) and a Long-Range (LR) configuration respectively, are defined. On basis of aircraft-level functions, simplified system models of the Environmental Control System (ECS), the Ice Protection System (IPS) and the Flight Control System (FCS) are derived. Whereas the power requirement estimations of other aircraft systems, e.g. galleys, avionics, and fuel systems, are mainly based on data from literature. The parametrized mission and system models are implemented into a tool and merged for
calculations and analysis. This approach enables the aircraft-level analysis and assessment of system technologies and concepts in early aircraft design phases, regarding secondary power requirements.

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