This paper presents a model-driven software development process which can be applied to the design of smart grid services. The Service Oriented Architecture Modelling Language (SoaML) is used to describe the architecture as well as the roles and interactions between service participants. The individual modelling steps and an example design of a SoaML model for a voltage control service are presented and explained. Finally, the paper discusses a proof-of-concept implementation of the modelled service in a smart grid testing laboratory.