

# Opportunities and Challenges Associated with the Development and Production of “Green” Veterinary Pharmaceuticals with Focus on Pharmaceuticals in the Environment (PiE) Both During Production and Use †

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**Abstract:** The opportunities and challenges associated with the development and production of “green” pharmaceuticals are embedded in the overall Sustainability Objective of the Pharmaceutical Industry. This presentation focuses on the risk assessment and management of Pharmaceuticals in the Environment (PiE) both during production and uses to minimize the release of pharmaceuticals in the environment. The presentation will also provide insight into the PiE assessment tools used for (i) evaluating the environmental risk resulting from the release of APIs in wastewater streams and (ii) the potential controls that can avoid/minimize the release of pharmaceuticals in the environment during the production phase. A descriptive PiE Risk Assessment and a Mass Balance providing the Predicted Environmental Concentration (PEC), compared with the Predicted No Effect Concentration (PNEC), are the fundamentals for the ‘*PiE Risk Assessment*’ and the basis for actions to minimize the release of pharmaceuticals in the environment during manufacturing.

**Keywords:** pharmaceuticals; environment; PiE; sustainability; risk assessment; production.

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